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Bei Jin

China's Path of Industrialization

Endeavors and Inclusiveness

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Series Foreword

Since the Opium War, modern China has come under attack and been bullied for its backwardness; this cultural circumstance has given many Chinese people a psychological inferiority complex, as China has lagged behind other countries technologically, institutionally, and culturally. Efforts to change the situation in which Western countries were strong but China was weak and to revitalize China needed to start with cultural criticism and culture renovation. Therefore, the Chinese people turned their eyes to the outside world and learned from Japan, Europe, the USA, and even Soviet Russia. We have always been overwhelmed by stress and anxiety and have had a burning desire to reverse the state of being bullied as a result of underdevelopment, poverty, and weakness and to catch up with and surpass the Western powers. In pursuing the more than one-hundred-year-old dream of building a powerful country and reviving China, we have focused on understanding and learning from others, but seldom, if ever, have others learned from and understood us. This has not greatly changed in the course of modernization since China's reform and opening-up in 1978. The translation and introduction of many Western works in the 1980 and 1990s is a very good example. This is the history of the Chinese people's understanding of the relationship between China and the rest of the world since the beginning of modern times.

At the same time, in pursuing the dream of turning China into a powerful country and rejuvenating it through material (technological) criticism, institutional criticism, and cultural criticism, the Chinese people have struggled to find a path that would make the country prosperous and the people strong while preventing the country from being ruined and the race from being destroyed. This path first represents a thought, a banner, and a soul. The key issue has been what kind of thought, banner, and soul can save the country, making it prosperous and the people strong. For more than one hundred years, the Chinese people have constantly carried out experiments and attempts amidst humiliation, failure, and anxiety. They have experienced failure in adopting advanced Western technology and thought on the basis of safeguarding China's feudal system and practicing a constitutional monarchy after the collapse of the Western capitalist political path and a great setback in worldwide socialism in the early 1990s. The Chinese people ultimately

embarked on a path toward a successful revolution with national independence and liberation; in particular, they have adopted a path leading to the socialist modernization of China—a road toward socialism with Chinese characteristics—by combining the theoretical logic of scientific socialism with the historical logic of China's social development. After more than 30 years of reform and opening-up, China's socialist market economy has rapidly developed; tremendous achievements have been made in economic, political, cultural, and social constructions; comprehensive national strength, cultural soft power, and international influence have substantially improved; and a great success has been achieved in socialism with Chinese characteristics. Although the latter project has not yet become full-fledged, its systems and institutions have basically taken shape. After more than one hundred years of pursuing dreams, China is rising among the nations of the world with a greater degree of confidence in the path it has chosen, the theory it has adopted, and the institutions it has created.

Meanwhile, we should be aware that given the long-standing cognition and cultural psychology of learning from Western countries; we seldom take the initiative in showcasing ourselves—historical China and current China in reality—to the world, though China has emerged as a great world power. Due to a deeply rooted view that "Western countries are strong and China is weak," developed through Western-Chinese cultural exchanges, Western people and nations seldom have a sense of Chinese history or the current developments in China, let alone an understanding of China's developmental path and such in-depth issues as the scientificity and effectiveness of China's theory and institutions or their unique value for and contributions to human civilization. As self-recognition is not displayed, the "China Collapse Theory," "China Threat Theory," "China State Capitalism," and other so-called theories coined by certain people with ulterior motives and differing political views have been widely spread.

During our development, based on "crossing the river by feeling the stones," we have paid attention to learning from Western countries, understanding the world and learning to know ourselves through Western experience and discourse but have neglected self-recognition and efforts to let others know us. When we strive to become part of the world in a more tolerant and friendly way, we are not objectively, truly understood. Therefore, we should describe the path to the success of socialism with Chinese characteristics, tell Chinese stories, disseminate Chinese experiences, use international expressions to show a real China to the world, and help people around the world realize that the Western manner of modernization is not the endpoint of human historical evolution and that socialism with Chinese characteristics is also a valuable treasure of human thought. This is undoubtedly a very important task for an academic cultural researcher with a sense of justice and responsibility.

In this connection, the Chinese Academy of Social Sciences organized its top-notch experts and scholars and several external experts to write the China Insights series. This series not only provides an overview of China's path, theories, and institutions but also objectively describes China's current development in the areas of political institutions, human rights, the rule of law, the economic system,

finance, social governance, social security, population policies, values, religious faith, ethnic policies, rural issues, urbanization, industrialization, ecology, ancient civilization, literature, art, etc., thus depicting China in a way that helps readers visualize these topics.

We hope that this series will help domestic readers more correctly understand the course of the more than 100 years of China's modernization and more rationally look at current difficulties, enhance the urgency for and national confidence in comprehensively intensifying reform, build a consensus on reform and development, and gather strength in this regard, as well as deepen foreign readers' understanding of China, thus fostering a better international environment for China's development.

January 2014 Zhao Jianying

Preface

Industrialization is a very unique phase in the history of human development. Even though it has just lasted two to three hundred years, material wealth created by humans in this phase exceeds the sum of wealth created in all historic periods prior to it. Wealth is unquestionably created from nature. Natural wealth, i.e., natural resources, provides man with materials necessary for the creation of wealth, and the process of production is first and foremost the interaction between man and nature. In the period of industrialization, man turned (processed) natural material into industrial goods, i.e., material wealth that can be valued, in large numbers with their fast-growing production capacity, especially the capacity of exploring and using huge natural reserves of energy resources. An entirely new chapter in the history of human development was henceforth opened.

What motivates human beings to create material wealth with industrial technology is their desire for material wealth and accumulation of such; and moreover, industrial production makes it possible for material wealth to be kept for long, which has thereby led to an infinitely strong "hoarding orientation". Viewed from historical facts, industrialization is inherently consistent with capitalism: the former provides the latter with technological means and the latter provides a dynamic mechanism for the former. Since capitalism included industrial production in the system of social reproduction that tends to seek profits and accumulate wealth infinitely, which is described by Karl Marx as "extracting surplus value", human desire for wealth has thereby become a strong motivation for industrialization, the productive forces the tool of wealth growth, and capitalist market economy a "machine" of resource allocation in creation of wealth. Economists envisaged and described the process of market operation in abstract physics terms, and depicted the trajectory of industrialization advancing evenly or unevenly along with the course. As a result, the era of industrialization has become an era of wealth, the trajectory of industrialization a trajectory of wealth growth, and the history of industrialization a tragicomedy of wealth accumulation. Industrialization is just like a huge machine spewing wealth, running at a very high speed that exhilarates humans greatly.

Hailing the Industrial Revolution and each country's huge achievements resulting from industrialization, people called the period when industrialization advanced rapidly the "golden age". Even Karl Marx, a radical critic of capitalism, also praised the ever revolutionary role of capitalism, and recognized its huge historical contribution in terms of wealth creation. However, criticism and curse of industrialization have never ceased, either. Rather than the "golden age", some people believe that it is the "Gilded Age", for it was gorgeous outside but a variety of sufferings and evils were hidden beneath it.

Even today, many people still keep asking, "Is industrialization worthwhile?" A young Israeli scholar Yuval Noah Harari wrote in *Sapiens: A Brief History of Humankind,* "The Industrial Revolution opened up new ways to convert energy and to produce goods, largely liberating humankind from its dependence on the surrounding ecosystem. Humans cut down forests, drained swamps, dammed rivers, flooded plains, laid down tens of thousands of kilometers of railroad tracks, and built skyscraping metropolises. As the world was molded to fit the needs of Homo sapiens, habitats were destroyed and species went extinct. Our once green and blue planet is becoming a concrete and plastic shopping center."[1]

Since humans have already undergone industrialization and planned to advance it further, have they really benefited from it? Or more precisely, can industrialization benefit most people? This is really a "universal" question for the whole mankind! The fate of mankind has been totally changed by the Industrial Revolution or industrialization, the greatest accomplishment ever in the process of human development, but where is the real value?

This question became more prominent in the twenty-first century, because whether economic development will benefit most people, countries and regions has already become the biggest and the most acute problem for human development. Whether it involves the economic, social or political field, or domestic or international affairs, this question must be answered very solemnly. When the United Nations set the Millennium development goals and the Asian Infrastructure Investment Bank (AIIB) proposed to solve problems concerning world poverty, sustainability of economic growth and other concepts more recognized by the people, the concept of "inclusive growth" was put forward as a heuristic reply to such question. This idea coincides with that of China, which is fumbling for the answer while facing difficult choices in the process of industrialization. China strongly approved of such an idea and stated firmly that inclusiveness must be set as the goal of economic development. Since 2009, Chinese leaders have called for the implementation of inclusive development on many international occasions.

Since the 18th National Congress of the CPC, China's new Central Committee leadership highlighted the inclusiveness of economic development as a key aspect of state governance. President Xi Jinping, General Secretary of the CPC Central Committee, pointed out that China's development must be sound development

[1]Harari (2014).

complying with the economic law, sustainable development complying with the law of nature, and inclusive development complying with the social law. While giving suggestions on the formulation of the 13th Five-year Plan, he also emphasized that the 13th Five-year plan must follow the social law and implement "inclusive development". So, the principle of "balanced, inclusive and sustainable" economic and social development was included in the "Proposals for the 13th Five-year Plan" adopted in the Fifth Plenary Session of the 18th Central Committee.

The so-called "inclusiveness" actually means to uphold the concept of "putting people first" and the principle of fairness and justice, to promote efficiency through fairness, to achieve economic growth, social progress and the improvement of people's lives simultaneously, to balance economic development with environmental protection, and to make all the people, especially the vulnerable, share the benefits of wealth creation during industrialization. From the perspective of globalization, it means to make all the countries, especially under-developed countries and regions, benefit from world economic development. Since the 18th National Congress of the CPC, President Xi and other Central Committee leaders have talked about the inclusiveness of economic development many times while making speeches in China and paying visits to foreign countries. The "Belt and Road" initiative and the vision of international cooperation have fully demonstrated the idea of inclusive development in building the international community with shared interests as well as the community with shared interests for mankind.

It is universally acknowledged that China has made splendid achievements after more than six decades' industrialization, especially since the reform and opening-up, so it is no exaggeration to call it a "miracle". However, there are still many aspects falling short of expectations. The most outstanding issues are: Can the benefits of wealth creation through industrialization be shared by all? How to balance industrialization with environmental protection? All these issues can be said to be centurial challenges for China's industrialization. This is why the Central Committee proposed the new vision of "innovative, coordinated, green, and open development that is for everyone". The concept of "development being for everyone" is the very value of industrialization. All in all, China must continue to uphold "inclusiveness" while advancing industrialization. The success of China's industrialization will be ultimately determined by whether China can achieve inclusive development in a real sense. Its biggest contribution to human development will be its success of building a more inclusive nation and its active participation in building a more inclusive world.

There are already many scholarly works on China's industrialization, and the author of this book has also written some on it. Therefore, this book will not discuss anything about the general history of China's industrial and economic development; rather, it is a reflection on China's industrialization from the perspective of industrial inclusiveness, aiming to study problems that China had encountered in the process of industrialization and how Chinese people coped with them. By putting China's industrialization in a larger context of the global economy, the

author tries to provide some new insights into how China will contribute more to world industrialization and human development as well as how it will become a responsible global power to benefit the world while striving for the great renewal of the Chinese nation.

Beijing, China Bei Jin

Reference

Harari, Y. N. (2014). *Sapiens: A brief history of humankind* (p. 454). Random House.

Contents

1 Industrial Revolution: In Full Swing in Both East and West 1
1.1 Revolution: The Origins in the West 2
1.2 The Sweeping Wave of Industrial Revolution Across the Globe 4
1.3 China's Industrialization: A Zigzag, Yet Great Journey 6
1.4 China's Industrial Reform: The Engine of a Comprehensive Reform and Opening-Up 12
1.5 China's Experience of Industrialization 17
1.6 What Industrial Revolutions Could Achieve as Demonstrated in China's Industrialization 21
References 29

2 The Call for Industrialization: Poverty Giving Rise to a Desire for Change 31
2.1 Traditional Outlook on Morality and Benefit 33
2.2 The Starting Point for Acceleration of Industrialization: To Legitimize Pursuit of Personal Wealth 35
2.3 The Start of Market Economy in China 38
2.4 Integration of China's Industrialization with Economic Globalization 39
2.5 The History of Wealth Creation Has just Started 43
References 48

3 High-Speed Growth: Massive Economic Expansion Through Low-Cost Alternatives 49
3.1 Robust Industrial Growth Has Turned China into the World's Second Largest Economy 50
3.2 Industrial Growth Propelled by High Savings Rates and High Investment Rates 54

3.3 Rapid Expansion of China's Industry in the Global Context 58
3.4 "Overcapacity" and Environmental Pressures 63
References 67

4 Back to the Normal: The End of History for Hyper Growth 69
4.1 A Transition from Hyper Economic Growth to a "New Normal" 70
4.2 The "New Normal" of Economic Development from a Long-Term Perspective 74
4.3 Features of China's "New Normal" of Economic Development in the New Era 81
4.4 The Impetus for Reform Under the "New Normal" 85
4.5 The Relationship Between Fairness and Efficiency and the Driver of Innovations Under the "New Normal" 91
4.6 Behavioral Characteristics and Rule Consciousness Under the "New Normal" 95
4.7 Shifting from "Anxious for Quick Success" to "Strategic Thinking" Under the "New Normal" 98
References 101

5 Path to Innovation: Technological Progress and Structural Upgrading 103
5.1 Sources of Industrial Technology 104
5.2 Status and Trends of High-Tech Industries 107
5.3 Technological Progress Under the Opening-Up Policy 113
5.4 The Role of SOEs in Industrial Technology Innovation 118
5.5 Establishment of a Modern Industrial System Amid Constant Innovation 122

6 Seeking Balance: Resource Conservation, Environmental Protection and Industrial Development 131
6.1 Industrialization Is a Process of Resource Creation and Consumption 132
6.2 China's Industrialization in the Face of Resource Constraints 133
6.3 Trade-off Between Industrial Development and Environmental Protection 145
6.4 Orientation of Government Policies on Resource and Environmental Regulation 151
References 158

7 Regional Gradient Development: A Complicated Topic for a Giant Country 159
7.1 Inter-regional Economic Relations During Industrialization 159
7.2 Industrialization Spreading to the Hinterland 166
7.3 The "New Normal" of Regional Economic Development 170

7.4 Changes in the Orientation of Regional Economic Development Policies . . . 176
7.5 New Challenges for Local Governments . . . 181
7.6 Promoting Synchronization Between New Urbanization and "Four Modernizations" . . . 185
References . . . 190

8 An Inclusive World: Entering a New Era of Economic Globalization . . . 193
8.1 China's Industrialization: A Rare, Tremendous Change in the History of Humankind . . . 193
8.2 Globalization: An Inevitable Result of Industrial Revolutions and Market Economy . . . 198
8.3 Economic Globalization Turned Out Less Satisfactory . . . 202
8.4 The Evolving Geopolitical Landscape in the Context of Globalization . . . 204
8.5 The Evolution of Global Governance Structure in the Context of Globalization . . . 208
8.6 China in the Era of Economic Globalization 3.0 . . . 213
8.7 The Spirit of "Inclusiveness" in the "Belt and Road Initiative" . . . 218
References . . . 223

Appendix: Milestones in China's Industrialization . . . 225

Bibliography . . . 239

Index . . . 245

Chapter 1
Industrial Revolution: In Full Swing in Both East and West

In 2015, China proposed an initiative to create Asian Infrastructure Investment Bank (AIIB) and the Silk Road Fund in a bid to invest and provide financing for infrastructure construction, resources exploitation, industrial cooperation, etc. of some countries concerned. It happened that Brisbane G20 summit also announced that one of the important moves to develop world economy is to perk up economic growth, to promote infrastructure investment and to establish a global infrastructure hub (GI hub).

In September 2016, Chinese President Xi Jinping proposed in G20 Hangzhou Summit that we should be dedicated to breaking a new path for growth and new ways of thinking on development, carrying out structural reform to unleash the potentials for wealth creation and the power of market. China also noted that particular importance should be attached to the role of infrastructure construction in fueling economic growth. It welcomed the initiative of G20 to establish a GI hub and that of World Bank to set up Global Infrastructure Facility (GIF), in the hope that the establishment of the Silk Road Economic Belt, the 21st Century Maritime Silk Road, the Asian Infrastructure Investment Bank (AIIB) and the Silk Road Fund would contribute to global infrastructure investment. Besides, China also proposed initiatives to build an open global economy, a win-win global value chain and a global market, to improve global economic governance and to establish a fair, just, inclusive and orderly economic and financial system around the globe.

All these show that the world is currently still in the phase of industrialization, though the Industrial Revolution started in Britain more than 200 years ago. On a world scale, the second Industrial Revolution characterized by infrastructure construction, resources exploitation and large-scale manufacturing hasn't been finished yet. Currently, most countries are still in the primary or middle stage of industrialization, and even developed countries are still in the middle of the Third Industrial Revolution in a bid to promote their economic and social development. China's industrialization is an integral part of global industrialization.

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The Industrial Revolution is the most splendid period of material wealth creation in the history of human development. The over-200-year-old industrial revolution is just a drop in the bucket compared to the long history of human civilization spanning thousands of years, however, it is so far the most important and crucial period of all. From the very beginning until now, it has radically changed the fate of mankind and the course of human development. It started out just in very few countries, and later has involved unstoppably more and more countries and regions. It has been an inevitable stage for most major countries.

Human society would not have grown and prospered without the Industrial Revolution. As far as the significance of industrial revolution is concerned, no event or economic/social phenomenon is a match for it. All in all, the Industrial Revolution is so far the greatest milestone in the history of human development, which dictates not only the way how humans survive, manufacture goods and live their lives at present and how they will do in the future, but the fate of mankind and human society as well.

1.1 Revolution: The Origins in the West

Origins of industrialization in the modern world can be traced back to Europe. Since the mid 17th century, especially after the "Glorious Revolution", Britain's agriculture and business had gained great momentum. Owing to its agricultural revolution and overseas colonization, Britain was then provided with a good supply of materials and huge market space necessary for industrial development. The combination of political, social and economic factors in Britain at that time determined it as the birthplace of the Industrial Revolution.

It is generally held that the industrial revolution in Britain was technically marked by the invention of the spinning Jenny and the use of steam engine. It ushered in an era of a new mode of production characterized by the replacement of manpower with machinery and fossil fuel as well as far greater production capacity and far higher productivity. Since then, great revolutionary changes began to take place in both economic and social fields. The era that the Industrial Revolution ushered in is called "the Industrial Age"; the countries that have already undergone industrialization are called "industrialized/industrial countries". Britain is the first industrial country that has completed this process.

In Britain, the industrial revolution at first touched the handicraft-based cotton textile industry. With the increasing sales of British goods overseas in the mid 18th century, backward technology of handicraft workshops could hardly meet the ever-growing demand in market and therefore was inevitably replaced by new technology. Against this backdrop, steam engines were invented and put into use. James Watt, who invented the modern steam engine and was granted the patent in 1769, is generally considered the iconic figure of the industrial use of steam engines, and 1769 the iconic year. Since steam engines were put into use, the output of British textile products had increased by five times, which not only provided a great supply of market goods

but accelerated the accumulation of capital. The Industrial Revolution was thereby launched forcefully and started to pick up steam.

Due to the rapid growth of manufacturing industry, transportation industry then needed urgently to speed up its development as well. In 1807, American engineer Robert Fulton developed "the North River Steamboat of Clermont", the world's first vessel to use steam propulsion for commercial water transportation. Since then, the use of steam propulsion for vessels had lasted for over a century. In 1829, British engineer Robert Stephenson developed the "Rocket" steam locomotive with a wagon carrying 30 passengers running at the speed of 46 km per hour, which marked the beginning of the Railway Age.

The replacement of manpower with machinery and that of manpower and animal power with coal-burning steam engines not only marked the beginning of the Industrial Revolution but showed in which direction the industrial revolution was heading technologically. Human physical strength was extended and strengthened and productivity greatly enhanced as a result of machinery being used in industrial production. Since then, industrial production had become the major means of material wealth creation.

In the 1830s and 1840s, most workshop-based handicraft production had been replaced by machinery manufacturing in Britain. Britain had by then basically finished the Industrial Revolution and thereby become the first industrial country in the world. Other western European countries also followed suit and embarked on the industrial revolution. By the 19th century, most of these countries had undergone the industrial revolution and become the first group of industrialized countries. From the beginning of the 19th century till the mid 20th century, Britain remained the largest industrial power and was considered "the empire on which the sun never sets". In the late 1860s, France also finished the industrial revolution and became a rather strong industrial power. Compared with Britain and France, Germany's industrial revolution started quite late, but in the 1850s and 1860s, its industry has already outpaced these two countries. In the 1880s, Germany had basically finished the industrial revolution and was, from then on, also added to the list of largest industrial powers.

The United States, formerly British colonies, also finished industrialization in the 19th century and established a powerful industrial system. The Unite States, a vast country with an abundance of natural resources, boasts favorable conditions for agricultural production as well as a broad market. As an immigrant nation, the United States can take advantage of immigrants or other channels to obtain advanced technologies from industrial powers such as Britain. Especially since its independence from the Great Britain, the United States could make policies in favor of industrial revolution on their own. For example, the United States began to adopt a protective tariff policy to protect its domestic industry from foreign competition. However, the U.S. industrial revolution was in essence the extension of the British industrial revolution. In the 1870s, the United States finished the First Industrial Revolution and started the second one. At first, Britain was still on a par with the United States in the level of industrial development. However, the United States soon overtook it and became the largest industrial power of the day after having finished basically the second Industrial Revolution in the 1920s and 1930s.

The Second Industrial Revolution was marked by the wide use of electricity and internal combustion engine. The invention and wide use of electricity in the 1870s unveiled the second wave of industrialization. The completion and use of large-scale power system in the 20th century is one of the greatest achievements that humans have ever achieved in the history of engineering science. The influence of the second Industrial Revolution is now still being felt and will continue in the future.

The historical period from the end of the American Civil War to the early 20th century was called "the Gilded Age", which was derived from Mark Twain's 1873 novel *The Gilded Age: A Tale of Today*. The American Civil War has cleared the way for its domestic industrial development. A surge in immigration to the U.S. and the discovery of new mineral deposits after the civil war gave a huge boost to American industrial development, resulting in the rapid growth of the nation's wealth.

By the early 20th century, the United States had become the most powerful and the wealthiest industrial country in the world. Historians depicted the United States of the day as an ugly scene of "rampant business speculation, severe political corruption, unscrupulous fortune-making and arrogant pride in great wealth". All critics believed that the so-called "Golden Age" was, as a matter of fact, a "Gilded Age", as it's gorgeous outside but a variety of evils were hidden beneath it. Thus it can be seen that the industrial revolution has always been regarded as a double-edged sword: on the one hand, it has won wide praise and applause; but on the other, it was also met with sharp criticism and even curses. Since the 1870s, the Second Industrial Revolution that began in Britain and the United States also rapidly spread to other European countries.

1.2 The Sweeping Wave of Industrial Revolution Across the Globe

Since the beginning of the Industrial Revolution in the 18th century in Western Europe, the momentum of industrialization has gone unabated, running like wild horses that know no fences. Endless industrial inventions and technological innovation are the best testimony to Karl Marx's ideas on the transformative nature of productive forces and its capacity of promoting historical progress. Since the mid 20th century, particularly the second World War, a larger wave of industrial revolution began to spread across the globe. However, different parts of the world were then in different phases of industrial revolution. As for many developing countries/regions (i.e., newly industrialized countries) from Eastern Europe, Latin America, Africa, especially Asia, they were then still undergoing the second industrial revolution. Later, they completed the industrial revolution and became industrial countries as well. In contrast, a group of advanced industrial countries including the United States were already in the middle of another industrial revolution based on high technology, i.e., the so-called "3rd Industrial Revolution".

The geopolitical landscape of the world has dramatically changed since colonial countries gained independence and became nation states after the Second World War. In order to gain political and economic independence, these nation states must establish their own industrial system to realize industrialization. Against the backdrop of economic globalization and the changing international division of labor, advanced industrial countries began to invest overseas and transfer their production capacity over there, which has thereby integrated all countries into a larger global economic network and accelerated the process of industrialization within all nation states.

From the 1950s to the 1970s, Japanese economy was recovering from the ravages of war, whereas East Asia, especially "Four Asian Tigers" (Hong Kong of China, Singapore, South Korea, and Taiwan of China), became the most prosperous region in the sweeping wave of industrial revolution across the globe. Due to the international transfer of processing and manufacturing industry, many industrial clusters were formed and some countries were made the first group of "emerging economies".

The pattern of world industrialization has changed significantly as a result of highly industrialized countries' reorganization of manufacturing production across the globe. In other words, more and more manufacturing industries have been spatially shifted to developing countries from developed countries such as the United States and European countries. Not only the "four Asian Tigers" gained strong momentum in economic growth, but emerging economies including China, Malaysia, Indonesia, Thailand and Vietnam also attracted huge foreign direct investment and participated broadly in the international division of labor. In these countries, industrialization just started out in labor-intensive industries with lower costs, but gradually spread to capital-intensive industries such as heavy industry and petrochemical industry, and then tech-intensive industries such as mechanical products manufacturing and electronic components manufacturing. According to some statistics, from the 1950s to the end of the 20th century, the share of industrial countries in the global output of manufactured products has reduced from 95 to 77%, while that of developing countries has increased from 5 to 23%.

In the second half of the 20th century, Latin America also underwent an industrial revolution and adopted the "import substitution" strategy, and thereafter emerged a group of newly industrialized countries such as Brazil, Argentina and Mexico. Despite some later economic setbacks such as "middle-income trap", it did pave the way for industrialization and create some industrial sectors with a competitive edge, such as aerospace and auto manufacturing. Besides, some African countries also began to seek national independence and industrialization. All in all, since the second half of the 20th century, the Industrial Revolution was no longer a rare occurrence just confined to the western world. Instead, it has already become an unstoppable trend all over the world.

In the meantime, a new industrial revolution called the "Third Industrial Revolution" was already in the making in the western industrial world led by the United States. Though varying in interpretations, people all agreed that the Third Industrial Revolution, driven by scientific and technological progress, has brought about new revolutionary changes to industrial technology, following the first and second industrial revolutions characterized by the use of steam engine and electricity. This

new revolution is marked by the invention and use of nuclear energy, computer, space technology and bioengineering, involving technologies in many fields such as information technology, alternative energy technology, new material technology, biotechnology, space technology and marine technology.

Especially in the last twenty years of the 20th century and the following period in the 21st century, new technical breakthroughs in many fields such as alternative energy, new material, and Internet application are now changing and will continue to change radically man's living environment, patterns of life, mode of production and even the social landscape as a whole. In recent years, some European countries such as Germany brought forth the concept of the "Fourth Industrial Revolution", which was defined by some people as a "green industrial revolution" and an "intelligent" one by some other people.

While the western world was undergoing the First Industrial Revolution, China was sheer an "outsider" and a "backward nation". China of the day was nicknamed a "sleeping giant" and Chinese people "sick man of East Asia". Severely tortured and humiliated by both domestic revolts and foreign invasions in the 19th century, China was plunged into an abyss of suffering. During World War II, China was invaded by Japan and the Chinese occupation lasted longest. Though China had finally won the victory, it was not mainly achieved through its industrial strength but earned tragically by Chinese people's blood and even lives; besides, it can not be achieved without support from the League of Nations, either. In China's long resistance against Japan occupation, there was a strong disproportion of industrial strength between Japan, an industrialized imperialist power and China, a poor and backward nation still in the phase of pre-industrialization. Inevitably, China's national economy had thereby suffered great losses.

To add insult to injury, China was plunged into a civil war after the Second Industrial Revolution. Only if the civil war was put to an end and the People's Republic of China was founded, it would be possible for China to embark on massive national industrialization. And moreover, it was not until 1971 that the government of the People's Republic of China was officially recognized by the United Nations as the sole legal government representing the Chinese people. Since then, China restored its lawful seat in the United Nations and became one of the five permanent members of the UN Security Council again. Arguably, New China's industrialization started out with very special conditions both at home and abroad, which would inevitably lead to many setbacks and zigzags along the course.

1.3 China's Industrialization: A Zigzag, Yet Great Journey

China started industrialization after the founding of the Republic of China. To advance industrialization forcefully and tenaciously has thereafter become China's eternal theme of development. China's industrialization has generally undergone two phases within over 60 years since the founding of PRC: in the first 30 years, China attempted to achieve industrialization through planned economy; whereas in

the second phase, i.e., the second half of the 60 years, China embarked on a transition to market economy and entered the Industrial Age. On a worldwide scale, China's acceleration of industrialization is one of the most significant events across the globe since the mid 20th century.

Shortly after the founding of PRC, the slogan of "banishing all blind faith, breaking conventions, and making scientific advances" was feverishly chanted, having ignited great passion in Chinese people. Just within three years, China's economy had basically recovered from the ravages of war. From then on, China began to intensely devote itself to the task of economic development. When China was making the first Five-Year Plan[1] (1953–1957), the former Soviet Union pledged to provide economic assistance to China in all respects. The assistance package included 156 assistance projects (mostly industrial projects), which, as a "booster", opened up a new era of China's modern industrial development. At the same time, China, due to special historical reasons, established the policy of "giving priority to heavy industry" while making and carrying out the first Five-Year plan for national economic development, which was directly influenced by the political decision of completing the "transition from new democracy to socialism" ahead of time. Regardless of whether it is irrational or "too ahead of its time", such policy did give rise to an industrial construction boom and prepare the ground for China's future industrial development. China's industrialization did "take off" from then on.

What China achieved in the period of the first Five-Year Plan (1953–1957) is the first significant industrial accomplishments of China ever in the history of industrial development. To look back, the then industrial system and the then path to industrialization characterized by China's desperation to establish planned economy and direct participation of governments in economic activity might not be very right in terms of the guiding ideology of industrial development, however, it did make sense in the historical context. On the one hand, China was then still in the primary stage of industrialization, and thereby the government had to play an important role in starting up and promoting economic development to prepare the ground for future industrial development. Only in this way will China successfully "concentrate resources to accomplish large undertakings" within its unique political and economic system. On the other hand, given the relatively small size and simple structure of the national economy, quotas set by mandatory plans could usually be fulfilled and even overfulfilled, for these mandatory plans were quite practical and the state planning body was rather easy to control. From a historical perspective, those industrial achievements that China had made during that period of time was of great significance and did pave the way for its future industrial development.

However, after China had made these achievements in the era of the first Five-Year Plan and completed successfully the socialist transformation of capitalist industry and commerce, Chinese people got quite carried away, mistakenly believing that so

[1]Note: China's Five-Year Plans are a series of social and economic development initiatives issued since 1953. Each Five-Year plan contains detailed economic development guidelines for the whole country, including major national construction projects, distribution of productive forces and proportions of the economic sectors in the gross domestic product (GDP).

long as "humans can free themselves from the prison of their minds", "they are sure to triumph over nature", and that "the crop from the field is as large as guts can yield". Showing disdain to western industrial achievements accomplished within over two hundred years, Chinese people jumped to the conclusion that China would surely catch up with and even surpass the UK and the US once several more "Five-Year Plans" were to be fulfilled. Therefore, since 1958, the first year of the second Five-Year Plan, China began to chant the slogan of "going all out, aiming high, more, faster, better and cheaper" and established it as the general line for socialist construction. Given a lack of modern technology and facilities, China launched a "backyard steel campaign" all over the country using backyard steel furnaces. An initiative of economic development had thus degenerated into a "political campaign" and "people's war". A heavy price had to be paid for the violation of objective economic laws and disrespect for science and technology: China had thereby seen great economic structural imbalances and extreme economic difficulties, and the second Five-Year Plan was forced to be aborted, too. It is for the first time that China had ever been taught such a huge lesson since the founding of PRC.

It is always good to realize its errors and try to mend its ways. In the next few years (1963–1965), China began to adjust its economic policies by backing off from the previous unbalanced development strategy. "To take enough backward steps" was then set as the target for policy adjustment. Not only many factories and mines were shut down, but tens of millions of workers lost their jobs and had to go back to their hometown. By 1966, the task of adjustment had been basically completed in a rather fast and orderly way. That's mainly because China's economy had great resilience and the administrative way of management inherent in planned economy has endowed China with special power of mobilizing resources, subordinating individual interests to national interests and enabling people to obey and implement principles and rules of planned economy.

Viewed from historical facts, China has never truly established the Soviet-style planned economy. However, the ideology of planned economy kept being intensified and solidified during those years. The economic disorder failed to discourage people from building planned economy; just to the contrary, China came to the conclusion that it must abandon capitalism and the so-called "bourgeois rights" and reject all forms of market exchange and anything related to market economy.

By the mid and late 1960s, planned economy, strongly influenced by the political line, had almost become a religious creed intolerant of any criticism or doubts. It dictated that the whole nation must cut its entire links with the global capitalist market economy, and that enterprise profit, piece-rate wage and bonus must be prohibited as they were believed to be linked with capitalist market economy; and moreover, they were even condemned as the sin of "economism". All this has inevitably resulted in the imprisonment of Chinese people' minds and thereby severe economic losses of China. In the late 1970s, the statistics seemed to indicate that "China had (by then) established a relatively complete industrial system", and that the policy of "giving priority to heavy industry" did somewhat pave the way for its industrial development (to be discussed in the next section). However, all these cannot hide the fact that China's industry had farther and farther lagged behind that of other countries,

especially developed countries; and moreover, most Chinese people couldn't benefit from industrial civilization at all and the country was still suffering from deep poverty and severe backwardness.

To realize industrialization and modernization as soon as possible is what Chinese people of the day had been desiring and dreaming of. However, from 1949 to the 1970s, attempts to bring about great changes through planned economy all ended up going to the opposite. Planned economy was thereby made a religious creed and even a dogma that everyone must accept and obey. In reality, it is impossible to achieve a 100% planned economy even in the industrial field where it was strictly required to be fully realized. For example, there were various "large collective" and "small collective" enterprises in the cities; rural commune-, brigade-, and team-run industries (later called village and township industries) began to take root and grow tenaciously in many regions especially coastal provinces. It would be impossible for these industrial enterprises to be included in the system of state planned economy. However, it was then ideologically indisputable that industrial economy must be owned by the state and put under state mandatory planning.

In the second half of the 1970s, chanting the slogan of "continuing the revolution and opposing capitalism" was finally put to an end. Since then, China started the epoch-making campaign of emancipating the mind. In the early 1980s, China confirmed in the Sixth Plenary Session of the Eleventh Central Committee of the CPC that "our socialism was still in its primary stage", a statement that provided the "major premise" for the reform and opening-up. It determined that, in that historical stage, economic development must be set up as the central task. Having gone through the first thirty years since the founding of PRC, China was to enter a new phase of economic development in the next thirty years.

As far as the system and mechanism of industrialization is concerned, China's industrialization followed the logic of planned economy in the first thirty years since the founding of PRC and the logic of market economy in the next thirty years. It has been proved that planned economy is impracticable, whereas market economy has a strong mechanism of motivating individuals to take initiatives to create more wealth. The logic of market economy has translated very well to China. It has enabled China to establish the principle of economic efficiency required by industrial societies, to unleash huge potential in production and to achieve unprecedented accomplishments. As a result, China's economy, especially industrial economy has grown rapidly, having thereby allowed all sources of social wealth to be fully tapped.

Once it broke out of the straitjacket of planned economy and began to develop a more market-oriented economy, China's economy soon began to take off and achieved hyper economic growth. Entrepreneurs were desperate for and optimistic with opportunities brought by market economy. Mentalities such as "Seize the Day, Seize the Hour", "Let Water Flow Rapidly[2]", "focusing on speed and scale" and "being anxious for quick success" were the most typical social psychology behind people's behaviors those days. Governments at all levels also believed that in order to

[2]Note: In 1981 when China enjoyed an economic boom, the so-called "Let Water Flow Rapidly" policy was put forward in order to meet a spike in resource demand in China.

fuel the economic growth, they should exert a force in the same direction with market force to push economic activity directly forward. So, by this logic, governments should grant enterprises and local economies "preferential treatment", encouraging them to go all out and go fast; governments should invest directly and "concentrate resources to accomplish large undertakings", mobilizing regions to vie for the highest GDP. It seemed that such practice conformed to the trend of market economy and even add to its dynamism. However, as it turned out, it more often than not led to a more volatile economy due to the government's unnecessary involvement and even over-exertion. Since the 1980s, China's economy has gone through many ups and downs. Whenever macro-economic volatility occurred, governments tended to make strong regulatory measures to address the problems. Especially in severe economic situations when the country suffered an overheated economy, economic downturn, or property price anomaly, governments would often directly regulate micro-economic activities through administrative means and treat all problems alike regardless of differences in the hope of producing an immediate effect through direct government interventions. All in all, the governments were too anxious for success.

More noteworthy, however, is that the ideology of planned economy and traditional concepts deeply rooted in China's society and culture over thousands of years still survived tenaciously under the conditions of market economy and even tended to be strengthened, notwithstanding the fact that China had by then already begun to take a more market-oriented economy and that the establishment of "socialist market economy" had already become a common understanding among the people. For instance, the psychology prevalent in the society of the day was that the government, who is much wiser than people, should be the one to solve the problem of great consequence, and therefore government officials can and should be the ones acting on behalf of the people and serving the interests of the people; besides, it was also commonly believed that the government at a higher lever is usually wiser than the one at a lower level, and therefore it was even more necessary for governments at higher levels to decide the things of greater importance. All these factors have strongly shaped the "Chinese-style" market economy and affected the direction and process of reform as well.

Though planned economy did not exist as an economic system any more and that the system of market economy had already taken initial shape within over thirty years, the government's direct regulation over economic activity and its control over resources were getting even much stronger and even being treated with more meticulous care. Besides, the governments tended to use administrative ways to regulate the economy, such as administrative examination and approval, the government overstepping its boundaries to decide things for enterprises, the government deciding the winner of market competition, and correction of mistakes through administrative means. To put it simple, it was believed that only the government is capable of concentrating resources, and therefore all large undertakings must be attended to by the government and all things of great consequence must be decided by the government. Especially when problems arose, the government always tended to step in or decide for enterprises; that is to say, the government would always be the first to rush to the front line to take full responsibility for everything. To sum up, how to handle the

relationship between government and market has become a key structural problem in the process of China's industrialization.

As China entered the second decade of the 21st century, people found out that, the government had overstepped its boundaries many times and that the "imbalanced, uncoordinated, unsustainable" pattern of economic growth had already become an increasingly acute problem. On the one hand, the government's excessive intervention in microeconomic activity has undermined greatly the dynamism of market and the effectiveness of resource allocation; on the other hand, due to the government's misplaced regulation or regulation failures, problems that market cannot solve spontaneously, such as "externality", "supply of public goods", "fairness in competition and distribution", "social security network" and "information asymmetry", have now stood out as major problems. People came to realize that the primary task of the government is to adjust the economic structure to better the decisive role of market in resource allocation. All matters that market and enterprises can handle should be assigned to them; even if problems arise, market and enterprises should respond in the first place to correct mistakes; besides, the government can mobilize other actors such as social organizations or rely on government procurement to help achieve the goal of regulation.

It's time for the government to accommodate to the new reality that market economy is gradually maturing. It should regulate economy in a way that conforms to objective economic laws and caters more to the needs of market economy. That is to say, the government must, on the one hand, play a constructive role in ensuring steady and healthy economic growth, and on the other, try their best to avoid any unnecessary or improper interventions in the operation of market economy, otherwise it would probably lead to bad influences or too strong side effects and even some lingering after-effects. The key is that the government must not overestimate its ability in information processing and economic regulation, that is, it should never arrogantly believe that it could handle all kinds of economic relations properly and maintain a satisfied, balanced state of economy at any time. But instead, the government must fully respect and stand in awe of the law of market economy, admit dispersion of knowledge and its limitations in information processing, be fully aware of its strengths and weaknesses, and decide when to let things be and when to hold the bottom line.

With the ongoing process of industrialization, economies got much bigger and more complex, and thereby increasingly difficult for the government to manage and regulate. Not until then did people come to realize what is most fundamental for the relationship between government and market. The code of conduct for micro-economic agents (i.e., individuals and enterprises) is that anything can be done except for the violation of law; whereas the government's guiding principle is that nothing can be done unless it is legally authorized. In the former case, the principle of "negative list" applies, whereas the latter adopts that of "positive list". However, it turned out that these two principles were just reversed in reality. That is, the principle of "positive list" was usually seen to be used by micro-economic agents especially enterprises. For example, a myriad of micro-economic decisions must be approved by the government; barriers were often erected to market access; and the enterprises

did not have the right to decide. Likewise, the government applied the principle of "negative list", expanding arbitrarily their right to decide, to intervene and to charge without legal authorization, as the government wasn't given a list of what it shouldn't do.

Therefore, "*Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform*" issued in 2013 pointed out with more clarity that "we should further economic structural reform, centering on the decisive role of market in resource allocation", and "economic structural reform is the focus of an all-round in-depth reform, with how to strike a balance between the role of government and that of the market, how to let market play a decisive role in resource allocation and how to let the government play its functions better lying at its core", which heralded a new stage of China's reform. In order to fulfill the penetrating and ever-enriching idea of "letting market play a decisive role in resource allocation", requirements must be met in many respects, including "to better the role of governments". Besides, the economic restructuring towards this end will inevitably cause others fields to have structural reforms, too. Therefore, China must make an all-round push for further reform. Under such circumstances, the 18th National Congress of the CPC made for the first time the important decision of furthering reform comprehensively. Even though economic restructuring is the highlight of such campaign, it is not all of them. The comprehensive reform also includes structural reforms in the field of politics, culture, society, environmental protection and party building.

1.4 China's Industrial Reform: The Engine of a Comprehensive Reform and Opening-Up

It is really rare and unprecedented for a country with a large population of more than 1.3 billion people to have undergone so huge and rapid changes after over a half-century's industrialization, roughly an average human's life span. During this process, industry has always been in the vanguard of each positive and progressive reform practice. Even now, industry is still the field with the most cutting-edge technology, whose reform and opening-up was carried out most thoroughly. And moreover, industry often "took the lead", even "by its lonesome", in bringing about changes and innovations while other sectors were still far behind in the process of reform of opening-up. So far, many problems that ever emerged and still exist now usually resulted from the large gap between industry and other sectors in terms of reform pace, just like an inevitable collision between an "express car" running at very high speed and "snail cars" that run at very low speed or even hardly move on the same lane of highway.

For over half a century, industry has always been the field with the most active productive forces and the most rapid reform. Industrial productive forces are the strongest and most revolutionary driving force for the reform in production relations

and superstructure. It not only applies to cities but the vast rural area; it is not only reflected in wealth creation but structural progression; it can not only make breakthroughs, but spread widely. The transformative power created by industry has played a decisive role since the founding of PRC. China's industrial reform took the lead in achieving the transition from central planning to a more market-oriented economic system; and moreover, it is also contributing greatly to the solution of common structural problems and problems concerning industrial policies across the globe.

Besides, the industrial reform has also acted as a booster and stimulant to the reforms in other sectors. For example, it calls for the establishment of a set of accommodating systems concerning labor, social security, market supervision, environmental protection, etc. Radical structural reforms are also needed in many fields such as communications and transportation, domestic and foreign trade, finance and taxation, financial services, science and technology, education and training, medical care, employment management, etc. Besides, the industrial reform in China has also played a very constructive role in promoting the administrative reform within the governments.

All in all, the industrial reform has given a strong impetus to social progress and is of great social significance. It requires all-round, accommodating economic and social reforms so that all reforms could support and promote each other. Once the industrial started, it would inevitably pull the gates of all other reforms, leading to an unstoppable trend of a comprehensive reform across the country with great momentum. It has precisely demonstrated Karl Marx's idea that the productive forces determine production relations and the economic base determines superstructure.

Industrial development and reform are the cornerstones of the "Chinese dream". In order to achieve the "great renaissance of the Chinese nation", China, since its founding, had been striving to lift its people out of poverty, get rid of backwardness and make all the people benefit from the building of a moderately prosperous society so that it could again stand proudly among the world nations as a strong global power. And industrialization is the very centerpiece of such renaissance of the Chinese nation.

China's overwhelming desire to develop industry over sixty years ago was the most direct example of it striving to realize the Chinese dream of national renewal. China might seem rather immature or simple-minded at that time, but it did judge the situation very well and choose a suitable path to industrialization given the circumstance. If properly handled, preference for heavy industry and the use of "import substitution" strategy within a given period would be a "shortcut" for less developed countries so that they can catch up with industrial nations more easily. Many developing countries did adopt such strategy to varying degrees in their history of industrial development.

To correspond with such development strategy, the state played a stronger and more direct role in industrial development. In particular, the state's reliance on administrative power to allocate economic resources and direct participation in industrial investment and production have become a distinctive feature of industrial development in that particular age. Therefore, from the 1950s through the 1980s, China had

been working on industrialization, and in the meantime, kept strengthening state planning and expanding the state sector of the economy as well. As we all know, state-owned enterprises (SOE) are very common in planned economy; but even in market economy, SOE, as a special form of enterprise, can also play an important role in starting and boosting the development of industry, especially heavy industry.

From the founding of the People's Republic of China to the late 1970s, China's industrialization, regardless of many setbacks, have undeniably made huge achievements in many fields such as national security, industry, agriculture, science, technology and infrastructure. However, according to relevant historical data, China's industry was very weak before the founding of PRC, and China annually produced only 923,000-ton steel, 18,000,000-ton cast iron and 61,880,000-ton coal at most at that time. When China was newly founded in 1949, its overall industrial output even declined by 50% (heavy industry declined by 70%, and light industry 30%) due to the ravages of war, and the railway just covered nearly 10,000 kilometers[3]. It can be seen from the following statistics that China in the year of 1949 had very typical features of the pre-industrialization era: the average life span of Chinese people was less than 40 years; the gross output value of agriculture and industry was about 46.6 billion RMB in total (gross output value of agriculture was 32.6 billion and gross output value of industry was 14.9 billion); the gross national income (GNI) was 35.8 billion RMB; gross social product was 51.8 billion RMB. If counted by US dollar, the GNP was US$12.3 billion, GNP per capita was US$23 and GNI per capita was US$16. In 1949, it produced 150,000-ton steel, 250,000-ton cast iron, 32,000,000-ton coal, 120,000-ton petrol, 660,000-ton cement and 1,300 machine tools.

After nearly thirty years' industrialization, China had, by the late 1970s, already established a rather complete industrial system and had fairly strong industrial strength, having thereby paved the way for the reform and opening-up as well acceleration of industrialization. In 1978, China's GDP grew to 356.51 billion RMB, among which the primary industry accounted for 27.9% (92.77 billion RMB), the secondary industry 47.6% (175.77 billion RMB), and the tertiary industry 24.5% (87.97 billion RMB). As for the secondary industry, the gross output value of industry had already reached 164.14 billion RMB. Seen from the industrial structure, China was not an agricultural country any longer at the end of the 1970s; instead, it had by then had good industrial potential (see Table 1.1). The industrial and economic achievements that China has made in "the second thirty years" since the founding of PRC were to a fairly large extent attributed to the unleashing of these potentials that had been gathered in "the first 30 years" since the founding of PRC.

The economic reform in 1978 ushered in a period of industrialization acceleration, in which China has made unprecedented industrial achievements. Industrial development played a pivotal role in maintaining China's high-speed economic growth and boosting its national strength substantially. Owing to the structural reform of industry, industrial growth has become a strong engine of China's economic and social development. The rapid industrialization has laid the foundation for China's strong global industrial competitiveness. In the 1980s and 1990s, China went all

[3] Xue (1988).

Table 1.1 China's output of major industrial products (in 1978)

Product	Output	Product	Output
Steel products	22,080,000 tons	Electric generating equipment	4,838,000 kW
Cast iron	34,790,000 tons	Machine tools	183,000 items
Steel	31,780,000 tons	Automobile	149,100 items
Raw coal	618,000,000 tons	Tractor	113,500 items
Crude oil	104,050,000 tons	Walking tractor	324,200 items
Electricity	256,550,000,000 kW	Internal combustion engine	28,180,000 hp
Timber	51,600,000 m^3	Engine	521 items
Cement	65,240,000 tons	Truck	16,950 items
Sulphuric acid	6,610,000 tons	Steel ship	865,900 tons
Sodium carbonate	1,329,000 tons	Chemical fiber	284,600 tons
Sodium hydroxide	1,640,000 tons	Cotton yarn	13,280,000 pieces (2,380,000 tons)
Chemical fertilizer	8,693,000 tons	Cotton (cloth)	11,029,000,000 m (10,286,000,000 m^2)
Pesticide	533,000 tons	Machine-made paper and paperboard	4,390,000 tons
Ethylene	380,300 tons	Synthetic detergent	324,100 tons
Plastic	679,000 tons	Bicycle	8,540,000 items
Chemical	40,400 tons	Watch	13,510,000 items

Sources Communique on the Result of Implementing the 1978 National Economic Plan issued by the National Bureau of Statistics of the PRC. (June 27, 1979)

out to compete with rivals and had managed to carve out a way through the global market with its comparative advantage, i.e., lower price, resulting in rapid expansion of production capacity and market share.

Even though such growth pattern was notoriously known for its high consumption and high costs, it did make undeniable contributions in that historical period. Within a fairly long period of time, a rather highly competitive industry remained almost the only and the most powerful weapon of China's economy. With the increase of global industrial sectors, China's industrial products have penetrated unstoppably the global market and expanded very rapidly. The "China Price" of many industrial products (or China's low "Price-Performance Ratio") has been greatly favored by global consumers and thus brought great impact on the global market, having changed dramatically the world pattern of industrial competitiveness.

However, China's other sectors' global competitiveness was still rather weak, which cannot be mentioned in the same breath with that of its industry. Surely, compared with some developed countries, China's industry is still not competitive enough. So far, China's industrial competitiveness is mainly based on the lower

prices of its industrial products, but rather inadequate in technological innovation. However, there is no denying that Chinese industry's marked progress since the reform and opening-up has greatly improved its industrial competitiveness, which has even shocked the whole world and made them feel great pressure. This is a "China issue" that has attracted a lot of international attention, which is called by some scholars the "China Shock".

Chinese industry's contribution lies in not only its own rapid development, but its strong impact on other sectors, that is, it has injected dynamism and power to others sectors' reform and development. For years, almost all major plans concerning economic development and people's livelihood were eventually translated into something related to industry: sometimes, they need accelerate industrial development, especially increase investment in industry; sometimes they need an advanced industry to support other sectors' development. For example, both high-tech industry and modern service industry must be built on an advanced industry. More importantly, others sectors have drawn more and more inspirations from industrial development, such as the industrial spirit (the principle of efficiency), industrial management (commercial management), industrial reform (self-responsibility) and industrial competition (anti-trust), which has thereby given a strong boost to their reform, opening-up and development. As a matter of fact, their reform, opening-up and development is mostly based on the experience they learned from industry. In some sense, China's industrial revitalization can be said to be the "the core of fission" of the great renewal of the Chinese nation in all respects.

China's industrial development has improved its status on the world stage significantly; besides, it is also the reason of China being accepted and welcomed by the world. It is its industrial achievements that turned China from a "backward nation" into an "economic power", from a "poor country" into a country with the world's largest foreign reserves, from a passive recipient of global free trade rules into an active advocate and defender of global free trade. Now, almost no major world issues would be solved without China's participation. All in all, China's strong industrial strength has laid a solid economic foundation for China's development, helped establish a good national image in the world, improved its status, say and influence in international negotiations, and therefore won great respect from the world that China hadn't received ever since the Opium War. At the same time, industrial products "made in China" have almost become everyone's necessities of life across the globe; China's industrialization has even become the engine or booster of many countries' economic growth, especially China's major trade partners. China's industrial growth is a good blessing for them, and its industrial recession will be their nightmare.

Until now, China's industrialization hasn't been completed yet, and the reform and opening-up is also still on its way. On the whole, China is currently still advancing industrialization along the path of world industrialization. On the one hand, China's industrialization can neither skip any major phases that world industrialization must undergo, nor blaze a trail to explore a totally new way. Overall, China's mode of economic development is technically the imitation and extension of world industrialization as well as some re-innovation. On the other hand, China's industrialization is

also very unique, as it has significantly changed the world pattern of industrialization within only several decades, which is unprecedented in world history.

The current reality for China, a vast developing country with a large population, is that the solution of almost all major and long-term social and economic problems China is now and will be faced with, is highly dependent on the rapid development of industry as well as the establishment of modern industrial system. Only an advanced industry can solve many problems concerning urbanization, transportation, land management, resources exploitation, water conservancy, environmental protection, land governance and even major problems concerning national security, people's livelihood and welfare. Therefore, to develop a stronger industry still remains the central task of China's economic development over a fairly long period of time.

Due to China's actual conditions, it is impossible to skip any necessary development stages in its process of industrialization Yang Li, a Chinese financial economist, pointed out in a research report, "Some people said that China should vigorously develop service industry, especially emerging services such as finance and high-tech industry. However, I think it needs serious discussion in the rationale, road map, etc. In recent decades, the level of service industry has been internationally used as an important indicator to measure a country's economic development level. However, only if it is compatible with the development stage, path and process of a particular country, will such philosophy produce good results on this country; otherwise it will be misleading. What might be most misleading here is that we might only notice the current leading role of service industry in developed countries, but neglect the fact that their national economy used to be dominated by highly developed manufacturing industry, and the harsh reality that China, a vast country with a large population, can neither just focus on service industry nor meet its domestic needs of manufacturing products by relying heavily on other developing countries just like what these developed countries did. In my opinion, we must always bear in mind the reality that China is a country with an extremely large population, whose industrialization and urbanization haven't completed yet."[4]

China's revitalizing efforts didn't start until more than six decades ago. So, only if China continues to advance industrialization at least for another three decades will it possibly become a truly strong and prosperous modern country by then. Therefore, China made the plan of "Made in China 2025", proposing that China aims to become one of the world top manufacturing powers in the next three decades, i.e., to catch up with the most developed industrial powers within thirty years.

1.5 China's Experience of Industrialization

Industrialization is the basis and prerequisite for a nation's modernization and prosperity, and it is especially true of China, whose advanced industry is the very backbone of economy. It is only through successful industrialization, the key to the renaissance

[4]Li (2009).

of the Chinese nation, will the establishment of a moderately prosperous society benefit all the Chinese people. China's ongoing industrialization has profoundly changed the global economic landscape. More importantly, China has thereafter begun to prosper and even stood out among all world nations.

Industrialization has remained the theme of world economic and social development for nearly two and three centuries. However, common but deep contradictions had already emerged in capitalist industrialization since the 19th century, resulting in a series of severe economic and social problems. That's why since the 1960s or 1970s, two strong voices were often heard calling for resistance of industrialization in some developed and developing countries. One called for the country to slow down industrial growth, proposing to realize the so-called "zero growth" by the end of the 20th century; the other one maintained that "a third path" should be taken, that is, rather than traditional economy or modern large-scale industry, the country should choose something "in the middle" to set its path apart from the industrialization path of western developed countries. They believed that large-scale industry is bad while small one is good. Even though the idea of "de-industrialization" did make some sense, history has proved that almost no country especially great power has realized economic and social modernization without undergoing industrialization.

In view of the then special international situation and its extremely weak industry, China chose to prioritize heavy industry after the founding of PRC, resulting in both good results and negative effects. Since the first Five-Year Plan (1953–1957), China began to concentrate all the resources all over the country to advance industrialization massively. Very soon, China has managed to build a rather complete and independent industrial system and make industry the backbone of the national economy. However, prior to that time, some industrial sectors even did not exist, and some industries were very small.

In the first 30 years since the founding of PRC, i.e., the era of planned economy, industrialization had greatly boosted social and economic development, but in the meantime, it also gave rise to a series of problems, which are mainly as follows: within the framework of a highly centrally planned economy, industrial growth was achieved at the expense of other industries' development especially agriculture; industry's high input, high accumulation and high consumption were maintained by "price scissors" between industrial products and agricultural produce; economic benefits were very low and the industrial structure was unreasonable.

In the second 30 years since the founding of PRC, i.e., since reform and opening-up, China has been committed to exploring an industrialization path suitable for China's national conditions, striving to ensure both GDP growth and industrial upgrades, to better the role of market, to use both domestic and foreign resources and markets while opening up further to the outside world, and to accelerate industrialization while forging ahead the reform. During exploration, China has accumulated a lot of experience which might be helpful to many countries. They are as follows:

First, thanks to the reform and opening-up, China sees a dynamically growing industry that fuels faster economic growth and greater social progress, a sound system of socialist market economy, and liberation of social productive forces. All this has given a strong boost to its industrialization. China's successful transition from

planned economy to market economy since 1978 has turned market a highly competitive arena for players, pressuring them to make technological transformation and even innovation so as not to lose. Driven by the strong desire for higher economic benefits, market players have contributed their fair share to higher, sustained industrial growth, having thereby created "China's miracle". Accordingly, the whole industrial production chain has also grown into a full spectrum, ranging from industrial products manufacturing to extractive industry, energy and raw materials industry as well as equipment manufacturing.

Second, China has successfully developed core competencies by making full use of its comparative advantage, i.e., lower prices of industrial products, which has laid a solid foundation for the acceleration of industrialization. In the 1980s and 1990s, China's production capacity and market share increased dramatically following its active participation in international competitions. In spite of high consumption, high costs and many other obvious defects of China's previous industrial growth pattern, Chinese industrial products were indeed made moderately competitive and did occupy a fairly large global market share. On the whole, the competitiveness of China's industry has been greatly enhanced. In this sense, an indelible contribution has been made to China's economic and social development.

However, China's industry is now still far from being globally competitive, still lacking indigenous technologies and cutting-edge innovations. So far, its industrial growth was still mainly driven by mass production of low-priced industrial products. Transformation of economic and industrial growth mode still remains a tough task ahead and there is still a long way to go before the core competency of China's industry is finally enhanced.

Third, an industry-led coordinated development among all sectors of economy is the source of dynamism for industrialization. However, China's industrialization is now still far from being completed and the journey is still tough ahead. At the current stage, almost all major plans on economic and social development are aiming for a more robust industry, which is vital to China's success in future competitions. More importantly, China has accumulated a lot of experience in industrial development, resulting in its industry playing a more powerful part as a role model of reform and opening-up. Such experience mainly involves industrial efficiency, commercialized management, self-responsibility system, competition rules and further opening-up, which have been of great help to other sectors in reform and opening-up. Therefore, industry is in some sense "the core of fission" of China's reform and opening-up as well as its great revitalization. In turn, other sectors have also expanded the market of industrial products and cleared many institutional obstacles to further industrial reform, having thereby fueled industrial growth and upgrades.

Fourth, institutional improvements in technological innovation are vital to solution of resource and environmental problems. As industrialization is the process of massively exploiting natural resources and tapping human resources, it will do much more harm to the environment than traditional agriculture did. If mishandled, industrial production and consumption of industrial products would lead to severe resource and environmental problems. On the other hand, industrialization is also a

constant process of increasing the supply of "resources". Therefore, in order to alleviate resource constraints and protect the environment, China must continue to boost industrial growth rather than put brakes on it. As a matter of fact, industrialization could have brought a much closer and more friendly relationship between human and nature (natural resources and environment), but it must meet some requirements: first, it must ensure higher efficiency in exploitation of resources as well as green development; second, incentives should be given to enterprises engaging in energy-conserving and environment-friendly industrial activity. Therefore, it is currently of critical importance for the government to encourage and facilitate such industrial activity.

Fifth, putting people first is a must for industrialization. In view of the fact that industrial growth in the past several decades has caused many environmental problems, the Central Committee of the CPC proposed an approach for sound development, i.e., the "Scientific Outlook on Development", which is in essence not to downgrade the importance of industry, but to make material advancement and creation of material wealth more people-centered. That is to say, the value of development should not be just measured by material achievements or wealth; rather, whether it can help improve people's lives and their living environment should matter most.

The value of development not only lies in how much material wealth it has created, but the civilized and orderly way of pursuing and creating material wealth, the fairness reflected in the sharing of economic benefits among all the people and the benign interaction between wealth creation and cultural and ethical advancement. Therefore, humans must try to live in harmony with nature while engaging in industrial activity, so that each human generation will be blessed with enough natural resources and enjoy freedom, equality and freedom in a culturally advanced, just and harmonious society. In this sense, industrial production is a matter of social responsibility. Industrial enterprises should be responsible for both stakeholders and the society: on the one hand, they must work to make sure their own businesses prosper; on the other, they must also try to benefit the society and even mankind as a whole.

All in all, industrialization is a modern process of constantly creating wealth and bringing social progress. For over six decades (since the founding of the People's Republic of China in 1949), industrialization not only remains the theme of China's economic and social development, but is of great value for the society and even mankind as a whole. Industrialization should contribute more to social well-being than to national strength building, which will become one of the distinctive features of China's industrialization in the new phase.

1.6 What Industrial Revolutions Could Achieve as Demonstrated in China's Industrialization

So far, no phenomenon of human development can be mentioned in the same breath with the Industrial Revolution. In the history of human evolution spanning millions of years, humans have been obtaining useful things from nature to maintain their basic living. The primitive mode of human "labor" or production is collection of food and hunting, which, after domestication of plants and animals, later evolved into agricultural production with planting and feeding as major forms. However, it is still a way of obtaining useful things from nature. In the long history of human development, there are very few things in the natural world that can be directly used by humans, so they must learn to turn useless things into useful things for the sake of further development, which is called "industrial" production. It is in essence an activity of processing and making "useless" things into useful things, the so-called "industrial products" or "industrial finished products".

Industrial production will be very limited, if it mainly relies on manual production. This explains exactly why the world annual economic growth rate per capita remained less than 0.05% in the past several thousand years. It can be said that man's living standards had not changed substantially within the previous two to three thousand years prior to the Industrial Revolution.

Since the Industrial Revolution, human's life and development was radically changed. Man was replaced by machines, primitive power such as manpower and animal power was superseded by industrial energy such as coal, petrol, gas and electricity, thereby having enhanced dramatically human productivity. The material wealth created since the Industrial Revolution has exceeded the sum of wealth created in the history prior to that.

Since industry can turn useless things into useful ones, it is thus capable of turning wastes into resources as well. For the sake of technical differentiation, things are divided into "waste" and "resources". If the things of no use to humans are called "waste", the things that can be used by humans are thereby called "resources". The boundary between "waste" and "resources" is totally up to human ability to use things, i.e., the level of industrial technology. The more developed industry is, the more things would be turned into resources. In the highly developed industrial system, all the things can be turned into resources.

Therefore, in the final sense, "resources" are all obtained through industrial means. It is the level of industrial technology that decides what things can be turned into "resources". Without industry, most things on the earth would be of no use to humans. With the rapid progress of industry, more and more useless things have been made into "resources". If industry is developed enough, there will be no "useless things". Even the "waste" or "trash" can also be turned into "treasure" if used as raw materials for industrial production. Not only industrial waste can be recycled, but consumer waste in cities can also be turned into "secondary mine". Turning waste into wealth by using science and technology is the mission of the Industrial Revolution. In this sense, the Industrial Revolution is a revolution that creates resources, which empowers

the industry to create resources and then the demand for resource consumption. Resources are created at first and then consumed.

Industry has strong creative power. The Industrial Revolution can make industrial factors penetrate almost every field and then have them "industrialized", such as farming, forestry, animal husbandry, fishery, communications, transportation, information transmission, culture and art, education, medicine, sports and fitness, leisure and travel. All these fields need industrial technology, and thereby industrialism is everywhere. On the other hand, industry has also given rise to radical changes in the form of war as well as "Industrialization of War". In the 20th Century, a century full of "industrialized" wars, all industrial products such as iron and steel, petrol, gunpowder, automobiles and airplanes and even nuclear technology could possibly be used as war tools. Strong military power is built on strong industry, and strong industry is reflected in strong military power. The two world wars in the first half of the 20th Century are actually "deviations" from the Industrial Revolution.

The biggest contribution that the Industrial Revolution has made to mankind is that it has turned industry into a carrier of and a must-have tool for technological innovation. The greatest scientific discoveries, technological inventions and even the realization of any outstanding imagination are all built on and achieved through industry. Scientific and technological progress is the soul of industry, and industry the body of scientific and technological progress. Most scientific and technological innovations are manifested in or conditioned by industrial development. Science and technology is closely related to industry, and the concept of technology means almost the same as that of industry. That is to say, industry is the very technology to maintain the survival and development of humanity as well as the unique talent that sets humans apart from other animals.

The Industrial Revolution is a miracle integrating science and technology with industry. Only industrial countries can possibly become innovative countries; only when a country has a developed industry especially a developed manufacturing industry could it possibly become a world leader in technological innovation. Therefore, the scientific and technological revolution and the Industrial Revolution share the same fate; industrialization is also scientification, i.e., the successful application of scientific knowledge; scientific rationality is the spinal cord of the industrial spirit. So far, the era of industrial revolution marked by scientific rationality as well as scientific and technological progress is the most splendid period in the history of human development.

All the material wealth available on the earth includes natural material wealth and material wealth created by humans. The economic activity in which humans obtain things directly from nature, such as hunting, collection, fishing and planting is called the primary industry, or generalized agriculture. The secondary industry, i.e., generalized industry is the human economic activity turning natural substances that cannot be used directly by humans into things ready to use, mainly including handicraft, extractive,[5] manufacturing and construction industries. Almost all material wealth

[5] Because of the feature of "being obtained directly from nature", the extractive industry is classified by some counties into the primary industry.

that can be preserved for long is industrial products, whereas products from primary and tertiary industries can hardly be preserved unless special industrial technologies are applied. That's why products from primary and tertiary industries cannot become the major form of material wealth.

So, all wealth, be it material wealth or non-material wealth, created by the primary and tertiary industries has been to some extent industrialized, otherwise they can hardly preserve for long. Strictly speaking, without industry, humans would have neither tools nor technologies to preserve things. Even though they could survive without industry, their material wealth would never be preserved and thereby living conditions would never be improved as well. Without industry, whatever abundant natural wealth would make no difference to humans, because they cannot use most of them. In this sense, the Industrial Revolution is the starting point for acceleration of material wealth creation and accumulation, and industry is responsible for accumulating material wealth for human development and providing material conditions for the preservation of non-material wealth.

It can be seen that the vast majority of people in the developed countries, where the Industrial Revolution has been completed, can benefit from material progress brought by industrialization. Prior to the Industrial Revolution, the whole mankind could hardly have the life that poor people nowadays have. So, the Industrial Revolution is the biggest advance that humans have ever made in people's livelihood. Since then, human society has entered the safest and the most sanitary era with the longest human lifespan. Owing to the Industrial Revolution, people's living conditions have been greatly improved, thereby better protecting people from natural disasters and damages, enhancing their ability to resist diseases, and enabling them to live in a clean and sanitary environment (in 1778, Joseph Brahma patented the first toilet which featured a valve at the bottom of the toilet bowl). Prior to the Industrial Revolution, the average human life expectancy was less than 30 years; after its completion, the average has exceeded 60 years. As for developed countries, the average human life expectancy has exceeded 70 years, and even reached 80 years or above.

On the other hand, the Industrial Revolution is also destructive in some circumstances, by which it not only means "creative destruction" brought by technological innovation proposed by Joseph Alois Schumpeter, but potential war destruction and ecological destruction. Due to the Industrial Revolution, wars have been industrialized and the eco-environment has become human ecology. In the era of industrialization, humanization of environment is actually also industrialization of environment. That is to say, the natural environment has been transformed by industrial activity, and industry has in turn become an inextricable part of environmental ecology.

Human development has been given wings since the Industrial Revolution, soaring rapidly into the sky. Since then human's great creativity kept gushing out, including both constructive creativity and destructive creativity. When some are constructed, some will inevitably be destroyed. So, as for construction and destruction, there is always some of each in the other in the history of Industrial Revolution as well as the history of technological innovation. For example, automobiles, one of the greatest industrial products as well as one of the proudest inventions since the Industrial Revolution, have improved greatly man's life, but at the same time also resulted

in 1.2 million deaths annually due to car accidents. The Industrial revolution has made more and more places including the rural area, cities, islands and even deserts habitable; but in the meanwhile, environmental pollution resulting from industrial production and consumption of industrial products also went hand in hand with such benefit: heaps of wasted industrial products and urban/rural trash are becoming an increasingly big headache. Besides, the Industrial Revolution also created arms and weapons, almost all of which are industrial products. Industrialization of war has made weapons capable enough to destroy the whole mankind; on the other hand, military industry is also the source of technological innovation, as arms race and war needs often act as a catalyst for the industrial revolution. To sum up, the Industrial Revolution has radically changed almost every respect related to human development; it is the greatest achievement of human creativity and imagination throughout the history as well as the greatest leap forward with the most far-reaching influence.

In his book entitled *Capital in the Twenty-first Century*, a rather controversial book that has attracted worldwide attention, French economist Thomas Piketty described a millennium human history of economic growth with convincing figures. He told us that per capita output growth rate of the world was almost zero before 1700, when economic development was extremely slow. However, since the Industrial Revolution, global economy has seen tremendous changes: acceleration of economic growth and expansion of income and wealth distribution gap. It can be said that the Industrial Revolution is man's proudest feat; but at the same time it also gave rise to many problems and challenges. At present and even in future, humans do not and will not have other options but continue to advance industrial revolutions; Only by doing so will economy continue to grow, and more progress be made. As a result, mankind will also have to deal with more complexities and difficulties.

Most of the time in the history of human civilization, China, an ancient civilization, remained the strongest country in the world, whether in territory, population or total production. However, since the Industrial Revolution started in Western Europe in the 18th century and made these countries "industrial powers", China, the giant, was suddenly belittled. Lack of strong industry, China was bullied by others, being too feeble to stand erect, regardless of its "vast territory and large population". In sharp contrast, Britain, which used to be considered an insignificant small country by China, had become the "empire on which the sun never sets" after it developed strong industry.

For thousands of years, China's development had been relying on diligent labor. That is to say, it expanded agriculture and handicraft industry mainly through increase of manpower. However, Europe and the United States had taken the lead in replacing manpower with machinery and non-human energy since the Industrial Revolution. In Britain, the birthplace of the Industrial Revolution, the earth suddenly turned into a storehouse of plenty of renewable carbon energy that took millions of years to form from animals and plants: at first coal and then petrol. The small island opened an era of mechanization, urbanization, industrialization, and factory production. Fifty years later, the Industrial Revolution spread to the other parts of the world.[6]

[6]McFarlane (2014).

Britain started industrialization 50 years earlier than other European countries and thereby was given strong advantages in both technologies and institutions, so that the British Empire could be well maintained for two to three centuries. Supported by a strong industry, it had established a large network of colonies all over the world and exerted strong control over them. For example, only 500 British officials were sent to India to govern 0.3 billion Indian people, but they did manage to put India under good control. In the 20th century, the United States became the greatest industrial power and dominated the world till the present day. By comparison to them, China's recent century is a history of humiliation without a strong industry being its backbone. A country without backbone will surely be fragile and vulnerable!

Both history and reality have proved that industry especially manufacturing industry is the "backbone" of a great power. Only if its backbone is strong could a great power stand erect. The history of New China (since the founding of PRC) within over half a century is a history of great endeavors to achieve industrialization. Despite many detours and setbacks and even a huge price, China did manage to build a strong industry and take off. As is known to all, its colossal industrial system is the very cornerstone of China's high growth and the rise to the world's second largest economy.

China's rapid industrial development within more than half a century has shocked the whole world; as such massive industrialization at such high speed had never occurred before in human history. It took Western Europe two to three centuries to make only around 20% world population live in the industrial society since the Industrial Revolution. In contrast, only within several decades, China's industrialization has successfully doubled the world population living in the industrial society. Owing to industrialization, China has seen a construction boom, enterprises and cities springing up one after another. Having been lifted out of poverty and backwardness, China has taken on an entirely new look: its output of most industrial products ranks among the first in the world; Shanghai has now become a metropolitan comparable to New York; Beijing is catching up with Tokyo; and Shenzhen has almost been on a par with Hong Kong Special Administrative Region (HKSAR).

Based on these rapid developments, some people jumped to the conclusion that China would soon enter the ranks of developed industrial countries, since industrialization has almost been completed in eastern China; besides, it is also believed that it is time to de-industrialize because industrialization seems to have come to a dead end because of overproduction of some industrial products. As a matter of fact, the mission of creating and accumulating material wealth hasn't completed yet in China.

Creation and accumulation of material wealth constitutes the great historical mission of industrialization. The amount of material wealth possessed by a country or an economy mainly includes natural resources and the stock of industrial products. That is to say, apart from resources endowed by nature, the material wealth possessed by every nation is mainly composed of industrial products especially production equipment created through industrial technology, buildings, transport system and all kinds of physical infrastructure. Whether a country has completed industrialization cannot be judged only by GDP, but more importantly by the amount and level of material wealth that has been created and accumulated in the process of industrialization.

Only when the task of creating colossal material wealth is basically completed, that is to say, when the society's goal is not to create material wealth but to enjoy the "service" (and to accumulate cultural wealth), the era of industrialization will come to an end. And moreover, even if that day comes, industry would not disappear, because human production and life cannot be sustained without industrial products or the accumulated material wealth.

According to the estimates of the accumulated material wealth made by Gang Li and Jichao Liu from the Institute of Industrial Economics, Chinese Academy of Social Sciences (CASS), the total wealth of the United States in 2008 is 5.9 times as much as that of China, and the total wealth of Japan is 2.8 times as much as that of China; productive wealth of the United States (the accumulated material wealth) is 3.8 times as much as that of China, and that of Japan is 2.4 times as much as that of China. But per capita productive wealth of the United States is 16 times that of China, and that of Japan is 25 times that of China. If the growth rate of the United States, Japan and China does not change, China will catch up with the United States and Japan in terms of productive wealth in 2034 and 2035 respectively; but as far as per capita wealth is concerned, it will take China even much longer to achieve that.[7]

So, judged from the industrialization's historical mission of creating and accumulating material wealth, China's industrialization is still far from being completed. Comprehensively, China's industrialization hasn't actually entered the late stage yet. In the current stage, one of the most pressing tasks faced by China is still to strengthen its industry so as to realize modern industrial civilization in a real sense.

The Industrial Revolution, a massive reform of the mode of production, has changed radically man's material world and life. Aside from material wealth creation, it has also brought very far-reaching influence on human development as well. A distinctive feature that sets humans apart from animals is that humans can engage in creative work based on scientific and technological innovation, which has been greatly manifested in the Industrial Revolution. One of the biggest contributions that industry has made to human development is that it serves as the carrier of and the must-have tool for scientific and technological innovation. Man's greatest scientific discovery, technological inventions and even the realization of any outstanding imagination must be built on and achieved through industry.

Scientific and technological progress is the soul of industry, and industrial development the result of scientific and technological progress. Industrial development is an endless stream of scientific and technological progress achieved through ceaseless innovations and "revolutions". The so-called industrial restructuring or industrial upgrading is actually the process of displaying the revolutionary spirit of industry and unleashing the power of innovation. Evolution from mechanization, electrification, automation to information- and intelligence-based production is an inevitable trend for industrial development. A great combination of science, technology, machinery, information, intelligence, art, and humanities in the process of industrialization has promoted human civilization and made more and more people benefit from industrial civilization as well.

[7] Li and Liu (2014).

In the developed countries, most people can benefit from material civilization created by industrialization, and their living conditions are also "industrialized". In the book *Abundance: The Future Is Better Than You Think* co-written by American writer Peter Diamandis and Steven Kotler, they said, "Today Americans living below the poverty line are not just light-years ahead of most Africans; they're light-years ahead of the wealthiest Americans from just a century ago. Today 99% of Americans living below the poverty line have electricity, water, flushing toilets, and a refrigerator; 95% have a television; 88% have a telephone; 71% have a car; 95% have a television; 88% have a telephone; 71% have a car; and 70% even have air-conditioning. This may not seem like much, but one hundred years ago men like Henry Ford and Cornelius Vanderbilt were among the richest on the planet, but they enjoyed few of these luxuries.[8]

From the embryonic stage of industrialization to the founding of PRC, China's industrialization had been very slow. Archaeologists and historians have found out some traces of industrialization in very old times of China, but unfortunately it couldn't move forward further in the following several centuries. Some scholars divided these years into three stages according to the development of China's industrial modernization. The first stage is the period of late Qing dynasty, in which China's industrial modernization had just kicked off. This period was mainly characterized by the enlightenment and knowledge dissemination of industrial modernization as well as the start-up of some modern industrial enterprises, including factory enterprises run by foreign industrial capital, the Qing government and private entrepreneurs respectively. The second stage (1912–1949) is the period of partial industrial modernization during the Republic of China. This period can be subdivided into three phases, namely, development of private industry during the reign of Beiyang Government (1912–1927), development of government-run industry during the reign of the nationalist government (1928–1936), and development of controlled industry during the wartime (1937–1949). The third stage is the period of all-round industrial modernization since the founding of PRC.[9]

Since the founding of PRC, especially since the end of 1970s, China changed gears in advancing industrialization, from a sluggish style (in the past century) into a rather progressive one, having thereby turned it into a highly-condensed process. It took China just half a century to achieve what western countries did within two centuries. It seems that China has condensed 200 years' industrialization into half a century's work. Innovation capability, disruptive power and all-round penetration are the very power of industry to bring changes to the well-being of mankind.

Just as scholars said, the world is currently undergoing the "Third Industrial Revolution" or even "Fourth Industrial Revolution". "The advancement of new, transformational technologies—computational systems, networks and sensors, artificial intelligence, robotics, biotechnology, bioinformatics, 3-D printing, nano-technology, human-machine interfaces, and biomedical engineering—will soon enable the vast

[8]Diamandis and Kotler (2012a).

[9]He (2015).

majority of humanity to experience what only the affluent have access to today."[10] All this is achieved on the basis of a highly developed industry. To put it simple, industry is the tool to put all scientific inventions, innovations and imaginations into practice as well as the technological basis for the improvement of most people's lives. China, which used to be among the most backward countries in terms of industrialization, is now catching up with top industrial countries at a shockingly fast pace in the process of industrialization.

Industry has not only created and accumulated a lot of wealth, but serves as one of the most important means to solve all major problems facing human development. Humans' survival, health, basic necessities of life, national strength, national security, solutions to problems concerning resources and environment are all based on and achieved through a developed industry. China's industrialization spanning over half a century has made it possible for hundreds of millions of Chinese people to have access to and increasingly benefit from industrial civilization, which is a splendid achievement in the history of human development. However, still a large percentage of 1.3 billion Chinese people are expecting industrial civilization, looking forward to truly benefiting from it. In this sense, industrialization will continue to be the theme of China's economic and social development; and moreover, it will keep bringing the greatest improvement in people's livelihood as well.

China's industry has demonstrated the most active and revolutionary nature of the productive forces; besides, with the spirit of reform and opening-up and the enterprising spirit, it has improved China's international status in no time. Progress and development in other fields must be built on a more advanced industrial and economic system as well as stronger industrial productive forces.

It should also be noted that the rapid industrial growth has in the meantime given rise to many problems, for example, the problem of "imbalanced, uncoordinated, and unsustainable development" is largely related to industrial growth. Therefore, industrial restructuring will be the key aspect to ensure a successful transformation of China's economic development mode. However, it does not mean to "de-industrialize", but to strengthen and deepen industrialization so as to achieve a green, sophisticated, high-end, IT-based, service-oriented industrial development.

Great practice breeds and nurtures great theories, and in turn, great theories also promote and guide great practice. Material wealth and cultural and intellectual products created through industrial technology have left China and the whole mankind very precious legacies. The Industrial Revolution originating in Western Europe has enabled people to develop a more scientific and rational thinking as well as an industrial spirit, namely, division of labor, accuracy, efficiency, strict discipline and punctuality. Industrialization seems to have magical powers: whatever country advances it will embark on the journey of reform, opening-up and freedom, and accordingly the spirit of fair competition, innovation, enterprise, putting efficiency first and building a welfare society will become the mainstream of that country.

Since the 1950s, many values such as emancipation, autonomy, hard work and strong power have already been planted in the national spirit through China's practice

[10]Diamandis and Kotler (2012b).

of industrialization. Since the end of 1970s when China began to carry out the reform and opening-up, it has not only created colossal material wealth that has shocked the whole world, but made extremely important contributions to the exploration and establishment of socialism with Chinese characteristics. Industry is in essence emancipation, practice and innovation; the industrial reform and opening-up provides the practical basis for emancipation of the mind, conceptual innovation and theoretical achievements. As we all see, industrial achievements have demonstrated most vividly and most strikingly that "practice is the sole criterion for testing truth"; industrial economy has become the most vigorous field that led the way in emancipating the mind and implementing conceptual revolutions; industry has become a modern field with the cutting edge technology, in which the reform and opening-up has carried out the most vigorously and thoroughly. It is China's huge industrial achievements that embolden its confidence in the path, theory, and system. Where would national self-confidence come from if there were no industry?

References

Diamandis, P., & Kotler, S. (2012a). *Abundance: The future is better than you think* (p. 10). New York: Free Press.

Diamandis, P., & Kotler, S. (2012b). *Abundance: The Future is better than you think* (p. 13). New York: Free Press.

He, C. Q. (Ed.). (2015). *Report on China's modernization between 2014 and 2015: A research on industrial modernization* (p. 218). Beijing: Peking University Press.

Li, G., & Liu, J. C. (2014). Estimation of China's provincial wealth index: 1990–2010. *China Industrial Economics, 1,* 5–17.

Li, Y. (2009). Macro-economic target: Changing priority from economic growth to employment. *Financial Forum* (run by Institute of and Banking, Chinese Academy of Social Sciences). No. 14.

McFarlane, A. (2014). *The invention of the modern world* (p. 50). Les Brouzils: Odd Volumes of the Fortnightly Review.

Xue, M. Q. (1988). The period of national economic recovery. *The great encyclopedia of China: Economics* (Vol. 1, p. 273). Beijing: Encyclopedia of China Publishing House.

Chapter 2
The Call for Industrialization: Poverty Giving Rise to a Desire for Change

Those who know China's history of reform since the 1970s must also know the secret experiment in Xiaogang village of Anhui province. In the winter of 1978, eighteen rural people from Xiaogang village put their thumbprints on a secret land agreement (see Fig. 2.1) to divide the land, local people's commune, into family plots.[1] Before

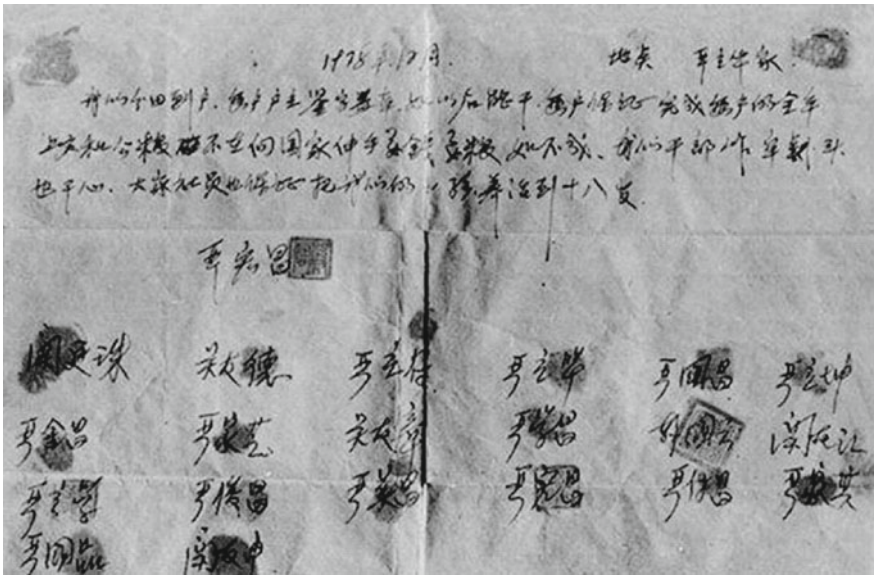

Fig. 2.1 "Contract of household responsibility" with the thumbprints of 18 rural people from Xiaogang village, Anhui province (*Sources* Xinhua News Agency)

[1]Note: Each plot was to be worked by an individual family who would turn over some of what they grew to the government and the collective whilst at the same time agreeing that they could keep the surplus for themselves.

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that, they had already entrusted their young children to the care of others in case something bad happened. As it turned out, their experiment proved a huge success, the secret agreement having thereby become the first declaration of China's rural reform kicking off a great journey, i.e., the reform and opening-up.

One of the participants recalled that they all agreed to contract out land to households, as they all simply believed that such bold experiment will fill their stomach; otherwise, they would starve. The farmer said, "Since we all agreed to do it, a written agreement must be made at a time when division of land into family plots was very risky. Our idea was very simple. We just wanted to make a written agreement to guarantee that nobody would back out. Illiterates just needed to put a thumbprint on it. That is how red thumbprints were put on that piece of paper, on which it says, 'Land will be contracted out to households. Each household head should sign on the agreement, promising to deliver tax grain to the state annually and never to ask money or grain from the state. We (village officials) will never back out no matter what happens. If we are sent to jail or sentenced to death due to such decision, commune members will raise our children before they reach 18 years' old.' Therefore, we all put our thumbprints on it. If higher authority is to make enquiries, we will take full responsibility. Our idea was then very simple: if land is contracted out to each household, people will probably not starve and thereby be more motivated to work. If we do have a good harvest, the country, the collective and each of us will thereafter live a better life."

Be it the reform and opening-up since 1978, or the Chinese agrarian revolution (1927–1937) calling for peasants to "overthrow local despots and distribute the land", or the founding of PRC in 1949 signifying that "Chinese people have stood up", the logic behind them is all the same, that is, poverty gave rise to a desire for change. It can be said that the battle against poverty and backwardness is logically the starting point of China's industrialization.

The embryonic stage of China's industrialization can be traced back to the first half of the twentieth century or some period even earlier than that. However, 1949, when the People's Republic of China was founded, is usually considered the year China kicked off industrialization. The next 60 years is generally divided into two stages: the initial stage of industrialization from the 1950s to the 1970s and the period of industrialization acceleration since the 1970s. The first period is usually called "the era of planned economy", whereas the second one is called the era of reform and opening-up, i.e., the period of transition from planned economy to market economy.

On a world scale, the period of industrialization acceleration, i.e., since the reform and opening-up, has changed radically the fate of China and even the global landscape. Judging from China's experience and inner motivations, its acceleration of industrialization is driven by people's strong desire to end poverty; and the political decision to carry out the reform and opening-up proves that people's call has been seriously answered. Therefore, China's great progress in industrialization is, in some sense, driven by the common will of people. It should be noted that it took China just thirty years or so to have completed the same task that western countries had finished within more than a century. Such sharp acceleration during this period is partly due to the objective law; however, it is also largely driven by the common will of the people, i.e., their strong aspiration to become better off.

2.1 Traditional Outlook on Morality and Benefit

China is an ancient civilization with at least 5000 years of history. Being "ancient" means not only an incomparably enormous cultural legacy but deep-seated traditions as well. On the one hand, the Chinese people are highly pragmatic and diligent, seeking to "seize the day" and "live in abundance". They strongly believe that family property should be handed down from generation to generation, and therefore, they tend to amass wealth and leave it to their offspring and descendants. But on the other hand, they also admire scholar-officials, who have lofty goals and pursue no personal gain, and despise those who are obsessed with personal gains, regarding as good virtues "selflessness" and the belief in "the whole world as one community".

So the principle of seeking personal gain applies to the material world, whereas that of despising personal gain commands the spiritual and moral world. In other words, the former is an unwritten rule in the realistic world (the so-called "small man's" world), which is well portrayed in the famous old Chinese saying that "all hustling and bustling in the world are for benefits"; while the latter is the virtue of gentleman described in the writings, just like what Confucius says, "The gentleman understands what is right; the petty person understands what is profitable." In a certain sense, China's traditional outlook on morality and benefit is rather paradoxical.

When Marxism and socialism (communism) centering on the ideal of public ownership were brought to China and the society was injected with a sense of political loftiness, Chinese people, deeply influenced by its traditional culture, tended to accept the concept of planned economy very easily. The government just needed to publicize the "good virtues" of "being selfless" and "obeying the government" and show contempt to "personal gain", the idea of socialist planned economy originating from the west would be successfully transplanted to the country that has been suffering economic depression for almost a century.

As China's written wisdom did not allow too much space for "personal gain" or "individualism", "individualism" and "private ownership" would have to surrender when it comes to principles, especially major ones. Those who pursue individualism and personal gain will definitely suffer a crushing defeat in an open, head-on confrontation with "public ownership" and collectivism, and thereby feel ashamed of himself or herself in public. As a result, promotion of planned economy in China did not meet with any political resistance from the founding of PRC to the 1970s; besides, most Chinese people have been holding the traditional view that one should "obey the superiors" and "the superiors are always more correct than their subordinates". That explains why China was then so naturally attracted to planned economy. If planned economy hadn't been divorced from China's realities and then suffered a great defeat in China, Chinese people would have every reason to believe that China's economy will grow rapidly and achieve a "Great Unity"[2] through political mobilization under planned economy.

[2]Note: "The Great Unity" (*da tong*) is a Chinese utopian vision of the world in which everyone and everything is at peace. It is found in classical Chinese philosophy which has been invoked many times in the modern history of China. (from Wikipedia).

In the initial stage of industrialization (1950s–1970s), Chinese people firmly believed that by practicing planned economy, China could become strong and prosperous. The Soviet Union, a socialist planned economy, had by then made splendid economic achievements and almost overtook western market economies. So, China was more convinced that China could achieve industrialization by practicing planned economy. During these two decades, it did follow the logic of planned economy and try to advance industrialization through political mobilization, however, all these attempts ended up with severe failures. For example, China ever attempted to leap forward but resulted in great social and economic disasters, which has even driven the national economy to "the brink of collapse". During that period, China's industrial policies did yield some good results, for example, a rather complete range of industrial systems were initially established and thereby laid a foundation for China's industrialization to some extent. However, on a world scale, the gap between China's economy and that of developed countries was much wider in this period: China's share of world GDP had declined to less than 5% (while it accounts for nearly a quarter of the world population), even lower than in the early period of PRC.

From the founding of PRC to the 1970s, China had been intensifying mandatory planning and trying to use political, administrative and legal resources (planned target is a "legal means" with binding force) to push forward industrialization massively, only to find that dynamism and vitality of micro-economy has been severely impaired. Enterprises had no intentions of making profits, as their business operation was not allowed to overstep the boundary set by state planning. Especially between the mid 1960s and mid 1970s, labor remuneration as an economic incentive was cancelled; normal wage promotion was aborted or randomly delayed; bonus was criticized as a political mistake of adopting "economism"; and even the principle of distribution according to labor was also called "bourgeois right", which was believed to tend to regress to capitalism. Such ideology had severely dampened people's enthusiasm for production and hindered the development of productive forces. The fundamental reason is that it had deprived hundreds of millions of people of their right to personal income and wealth, i.e., their right to seek prosperity. Besides, the government even ridiculously prohibited production units (factories) from seeking profits; for fear that it could affect the implementation of state plans and undermine the "balanced and proportionate" development of the national economy.

How could possibly an economy, lacking severely motivation, vitality and enthusiasm for production, lead to high efficiency and industrialization? How could possibly a country, where pursuit of wealth was considered "immoral" or even "against the law", create more wealth? Even though it is not wrong at all for a society to publicize the spirit of selflessness, such a social climate, where money was considered as the source of all evils, money-making immoral and profits the sins of businessmen, would definitely not create an economic boom. This is the real situation of China's industrialization during the period from the 1950s to 1970s. It seemed to be haunted by a ghost, which kept crying, "Wealth is immoral!" The same is true of Europe in the Middle Ages, when the religious doctrine kept reminding people that "it was easier for a camel to pass through the eye of a needle than for a rich person to get to

heaven." Their logic was that those who seek material wealth would not end up well and even couldn't go to heaven after their death.

Therefore, in order to develop economy and realize industrialization, China must unleash the power in hundreds of millions of people, who desire to get rid of poverty and seek fortune, and make it serve as the impetus of liberating the social productive forces. As a result, China must throw off the shackles of old systems and concepts. This is the simple motive behind the campaign of "emancipating the mind" and "the reform and opening-up" since 1978. However, such social reform was not actually motivated by ideological ideals (though it is politically reflected in the struggle between different ideologies); rather, it was just a great exploration aiming to solve realistic economic and social problems in the most practical way.

In some sense, it can be said that China had no alternative but to carry out the reform and opening-up, which was a forced "revolt" against traditional ideologies and concepts, that is to say, at first China began to doubt traditional systems and concepts of planned economy and finally abandoned them. However, it was then considered "high treason" and even "against the Constitution" to deny planned economy, because the Constitution then prescribed very clearly that "China is a socialist planned economy". Opposition to planned economy might lead to severe legal and political punishment at that time.

Thirty years ago, nobody had ever imagined that such dramatic changes could and have already happened to China thirty years later, when people began to believe that nothing could be more right than denial of planned economy and longing for market economy. So, what has brought about such great changes to China with a large population of more than 1.3 billion people within just three decades? Though it can be analyzed and explained from many perspectives, the following reason is one hundred percent the most decisive one: in terms of political ideology, China had completely abandoned the belief that "poor socialism is always better than rich capitalism", so that hundreds of millions of Chinese people were given a strong and constant economic impetus to get rid of poverty and seek prosperity. Such great power unleashed from the reform and opening-up has provided China with a huge impetus to liberate the productive forces and accelerate industrialization, which has thereby made China take on an entirely new look since then.

2.2 The Starting Point for Acceleration of Industrialization: To Legitimize Pursuit of Personal Wealth

In order to accelerate industrialization, China must carry out the reform and opening-up. To start with, China must emancipate the mind of the Chinese people. As mentioned before, people used to be constrained by traditional ideologies. But why did the Chinese people finally decide to break free of traditional ideologies and venture to reform at the risk of "violating the laws, regulations and policies"? That's because they were too poor! It is extreme poverty and the great economic gap between China

and developed countries that forced China to emancipate the mind and to change from utopianism (the ideological ideal) to pragmatic realism. From the 1950s to the 1970s, China's publicity department kept telling the people the "beautiful" lie that Chinese people live an affluent life, while two thirds of the world population are still "living in an abyss of suffering", waiting for Chinese people to come to their rescue. There is no denying that during this period time China had "tried very hard to catch up with developed countries", "going all out and striving for the best", but these policies and efforts have later proved misplaced. Almost thirty years later had Chinese people just begun to open their eyes wide to see the world, only to find that China was actually extremely poor compared with developed capitalist countries and even newly industrialized countries! And even to guarantee their basic life is also a luxury! So, what is wrong?

To emancipate the mind, China should at first know what "political correctness" is. The philosophical premise of "political correctness" is that one can tell truth from fallacy. Therefore, a great debate over the criterion of truth kicked off in the late 1970s, heralding the campaign of emancipating all Chinese people's mind. At last, people agreed that "practice is the sole criterion for testing truth". But how did people make practice test truth? At first, Chinese people should admit and face the reality. What was then the basic reality for China? Poverty and backwardness! People had to admit that China was then very far away from achieving the communist society or socialist society, and that it was then still "in the primary stage of socialism" and would remain long. This is the first social consensus that China had reached after people "emancipated the mind" and acknowledged that "practice is the sole criterion for testing truth". As a result, they came to the conclusion that poverty is the biggest enemy, and that creation of more material wealth would be the most pressing task. Within a fairly long historical period of time, "the contradiction between the ever-growing material and cultural needs of the people and the low level of production would be the basic one for Chinese society." Therefore, to make economic development the central task became the only right choice for China.

However, the problem is that Chinese communist party had ever "made economic development the central task" since the PRC was founded, but later began to "take class struggle as the key link", "having politics in command", and "giving priority to politics". So, since economic development was considered the central task in both periods, namely, before and after the reform and opening-up, is there any difference between them?

Prior to the reform and opening-up, the mechanism of planned economy was at work, that is, economic development, revolving around accumulation of public wealth, was mainly achieved by breaking down and implementing mandatory targets. In other words, under planned economy, economic development was motivated by pursuit of public wealth and "country" is the subject of public wealth; so, planned economy required a set of systems and mechanisms geared towards national wealth accumulation, i.e., a mandatory planned system based on public ownership in the whole society (and the mechanism of social mobilization). As far as motivation mechanism is concerned, traditional socialist planned economy was driven by the

desire to build public wealth,[3] so any practice of seeking personal wealth (personal property and enterprise profits) was considered immoral and even illegitimate. Practice has proven that such motivation could hardly maintain long-term enthusiasm for production or solve the problem of low efficiency at its source; in particular, the unstoppable spread of bad working attitudes and codes of conduct such as laziness, negligence and dependence would erode the base of productive forces of the whole society, thereby throwing the whole country into an abyss of mass poverty amidst the slogan of "aiming high to achieve lofty ends" (namely, to build China into a strong country by fulfilling national plans selflessly and unconditionally).

Owing to the reform and opening-up, China made a great breakthrough in the system of planned economy, i.e., legitimization of the pursuit of personal wealth and motivation shifting onto pursuit of personal income and wealth. To correspond with that change, China began to allow and encourage "some people and some regions to get rich first", legitimizing the economic responsibility system and economic incentives in microeconomic activity. Therefore, the rural reform started with the household-responsibility system and the urban reform started by allowing SOEs to keep separate accounts, assume responsibility for their own profits and loss and seek profits as their major goals.

If a society follows the logic of traditional planned economy, it will never build too much personal wealth regardless of how developed a society is and how much wealth it has created. In a strict theoretical sense, personal accumulation will be definitely impossible under planned economy, because public ownership dictates that individuals can only have "consumer goods" or "consumption fund" and that all productive accumulation must be publicly-owned. So, under planned economy, there will be no mechanism for personal wealth accumulation at all, and all wealth accumulation concentrates in the very social planning center (country or government; ideologically, any personal pursuit of wealth was immoral and even illegitimate, and it is also true of enterprises' (factories') profit-seeking behavior, which was believed to be unjust and against the principle of "political correctness". It was then denounced as a capitalist behavior "with profits taking command" (i.e., anti-socialism).

Since the reform and opening-up, China successfully emancipated the mind and legitimized the economic responsibility system and economic incentive mechanism, and thereby acknowledged the existence of non-public sector and even encouraged its development as well. It means pursuit and accumulation of personal wealth has been de facto legitimized. The society even began to encourage and commend "Ten-Thousand-Yuan households" and "millionaires" who "got rich through hard work", which implies that enterprise would since then be considered as an independent economic agent seeking profit maximization. Chinese Economist Yiwei Jiang then proposed the theory of "enterprise-based economy".

It can be said that, from the very beginning, the reform and opening-up has consciously or unconsciously prepared the cognitive ground for the introduction of the mechanism of wealth creation and accumulation. Even though it just opened a gap

[3] The author ever argued that even the public sector of the economy would also have private economic factors, and the latter are one of the drivers of economic growth. See: Jin (1993a, b).

in the system of planned economy, what happened next did prove that the reform and opening-up has had a subversive impact on planned economy and given a strong impetus to the acceleration of industrialization. So long as pursuit of personal wealth is legitimized, the whole society will undergo radical and revolutionary changes and that will be unstoppable.

2.3 The Start of Market Economy in China

Since 1978, China embarked on a journey of reform and opening-up, unveiling a transition from a planned economy to a more market-oriented economy, which has a decisive impact on China's acceleration of industrialization. However, such transformation was not achieved immediately, but instead it was a gradual process. From 1978 to the end of 1980 s, China began to encourage individuals to seek personal wealth and enterprises to assume sole responsibility for their own profits and losses with a view to making up for the deficiency of planned economy, i.e., lack of dynamism at a vertical level, which is the so-called policy of "putting regulation by market forces in the secondary place"; but these incentives were just used vertically to transform the dynamic mechanism of planned economy.

In 1992, Deng Xiaoping stated very clearly, "market economy can also be practiced under socialism"; in the same year, an official announcement was also made in the 14th National Congress of the Communist Party of China, which signifies that China is to embark on a radical reform of socialist economic system. It said, "economic restructuring aims to establish and improve the socialist market economy, in which public ownership and distribution according to labor should play the dominant role and other sectors of the economy and other modes of distribution serve as a compliment".

The most fundamental difference between market economy and planned economy is that planned economy is based on a top-down motivation and resource allocation mechanism, whereas in market economy, people and allocation of resources are motivated by pursuit of personal wealth. A planned economy mainly focuses on and pursues overall objectives of the society, while in a market economy, focus on and pursuit of individual interests underlies the realization of overall interests of the society.

In technical terms, market economy believes that even if each individual might act like an "economic man" ("economic man" believes that everything is driven by maximization of personal interest), the whole society could still realize maximization of overall interests; whereas planned economy maintains that if economic behaviors are mainly guided by pursuit of individual interests, the whole society's production would be in great chaos, not to mention maximization of the society's overall interests. The former believes that market can play an effective role in allocating resources, whilst the latter holds that market cannot achieve "planned and proportionate" development, and that resources must be allocated by the state planning center. According to such theoretical logic, the government would in reality become

the "command center" of all economic activity under planned economy. If a government wants to command effectively the economic activity, public ownership of the means of production must be realized in the whole society. As a result, it would actually turn production units into an extension or attachment to the government.

Therefore, the moment China decided to develop market economy, it was already well prepared for a forthcoming radical reform of the economic system, including the inherent logic and beliefs. In a planned economy, pursuit of social goals (social wealth) will be moral and legitimate, while pursuit of personal wealth (personal income and wealth and enterprise profits) will be considered immoral or even illegal, at least very dishonorable. However, in a market-oriented economy, pursuit of personal wealth will be both moral and legal, and moreover, any behavior to seek self-interests by any microeconomic agent (individual and enterprise) could possibly maximize social welfare. So, market economy maintains that autonomy and freedom of choice in pursuing personal wealth should be protected to the utmost (but at the same time, behaviors to pursue personal wealth must be standardized, regulated and even controlled as well). Because what underlies the "beliefs" of market economy is the belief that if individuals' autonomy and freedom of choice in pursuing personal wealth is best protected, the greatest potentials (the economic man's maximization of interests) will be unleashed from the people at the grass-root level and therefore they will be mobilized to create wealth to the utmost, and social productive forces will be emancipated to the maximum as well; besides, it is also based on another belief that myriads of "economic men", whose interests are maximized, will ensure maximization of social welfare.

Practice has shown that individual's initiative and the mechanism of seeking wealth could be very strong under market economy. By allowing and encouraging micro-economic agents to take more initiative and have more freedom to seek personal wealth, market economy could indeed emancipate the productive forces of the whole society greatly and bring a surge of social wealth. What China has achieved in the reform and opening-up within over three decades has shocked the world; China's miracle-like industrialization has changed dramatically the global pattern.

2.4 Integration of China's Industrialization with Economic Globalization

Industrialization and market economy are both in essence open and oriented towards globalization. China's decision to develop a more market-oriented economy and accelerate industrialization has, as a matter of fact, determined that China must and will inevitably integrate with world capitalist market economy. Therefore, being duty-bound and even ready to pay any price, China applied to join the World Trade Organization (formerly known as the "General Agreement on Tariffs and Trade"). It means that China's reform aims not only to establish a socialist market economy, but

to recognize the internationally acknowledged basic order and competitive rules of market economy and to integrate China's market economy into the global network of market economy. Such a strategic turn in China's path of industrialization will surely change the world pattern of industrialization.

In December, 2001, China was officially admitted to the World Trade Organization (WTO), which is a great historical event with very far-reaching influence. The WTO is the international "club" for global capital, best reflecting international capital's need for global expansion and free competition. The history of the two world wars shows that capitalism has insatiable desire for wealth and tends to expand unlimitedly; without being constrained by certain norms or competition rules, capital's endless pursuit of wealth would develop into plunder, aggression and war.

Having learned a hard lesson from the two world wars, the great powers established a set of rules for capital's global competition, i.e., the World Trade Organization. It acknowledged and guaranteed capital's right to "fairly" seek wealth around the world, and therefore it could prevent unjust blockade (monopoly) and military conflict rising from wealth competition. China's bid to join the WTO means that it is ready and courageous enough to compete with others in this international club for capital, even though many rules dominated by developed capitalist countries are not so fair for China as an emerging country.

Some people believed that as China's economic structural reform was driven to a large extent by the initiative of opening up to the outside world, China's entry into the WTO would inevitably give a strong boost to its market-oriented reform, and that China seemed to have no other choice but to "integrate with global economy" in the reform. If China's economic structural reform prior to its entry into the WTO was a completely voluntary move, the one afterwards would be to some extent "involuntary", as China would have to meet domestic needs on the one hand and face international pressure on the other. China's industrialization would be therefore forced to integrate into the global economy; and moreover, it would have to adapt its domestic economic structure to international rules. Not only its enterprises should follow international rules for trade and competition, but the government's behavior would also be bound by them.

That is to say, after its entry into the global competitive network of market economies, China must accept the world's basic rules for wealth creation and accumulation. The current international rules for market economy were established first and foremost to safeguard free competition among capital in the wave of globalization. Therefore, the WTO essentially acts as a check on government behavior, that is to say, the WTO commits all governments not to limit or prevent global free trade or investment.

Can China, as a country with weak capital strength, stand the fierce global competition after its entry into the WTO? People used to worry that China's history lacking wealth accumulation might lead to Chinese enterprises being no match for international capital, as capital is the result of wealth accumulation. However, it did not turn out the way they expected. Chinese enterprises, which kept fighting relentlessly and were ready to pay any price in the competitions, have carved out a way through in the global market competition and expanded its market share very rapidly.

As a matter of fact, the Chinese nation has a very strong sense of wealth accumulation. In order to obtain income and wealth, Chinese people are more willing to work harder than people of most countries; and moreover, Chinese people are more inclined to trim their spending for savings or investment so that more wealth would be left to their next generations. This explains why China is one of the countries with the highest saving rate and investment rate. But unfortunately, Chinese people's dreams of wealth were repeatedly shattered by turbulence and disasters in the course of history. As China has a very large population and vast land, its GDP did manage to remain on the top for long after several thousand years of pursuit of wealth; however, if it is distributed per head, China was never too much a wealthy nation. Especially since the western Industrial Revolution, China was suddenly belittled and became a poor country, and its situation of poverty and backwardness was not changed until the 1980s.

Based on the data provided by Angus Maddison, Fang Cai, a Chinese economist, pointed out, "Till 1700, Asia still accounted for 61.8% of the world's GDP, and China, as the biggest Asian country, contributed 22.3% to the world's GDP. However, all their GDP per capita was slightly below the world level because China, Japan and thereby Asia all had a large population. But it was just little bit lower. From 1500 to 1820, compared with the world average and the Western Europe average, Asian population growth rate was slightly higher, that of Japan a bit lower, but that of China far higher. During that time, China's GDP growth rate was higher than the world level and roughly the same with that of western Europe. However, due to China's higher population growth, its GDP per capita was far below the world average and farther lower than that of Western Europe in 1820, though it had already made up 32.9% of the world's GDP.[4]

China, a hard-working and frugal nation, which is more willing to pay more to create and accumulate wealth, was however greatly disillusioned after the dream of wealth was repeatedly shattered over a long period of time. That era is the most typical period of "Chinese Paradox" and "Chinese tragedy" ever in the world history.

By contrast, the era of industrialization acceleration since the reform and opening-up is a rare, peaceful period of time (over thirty years) in China's history. Chinese people could finally settle down to create and accumulate wealth, without worrying that their dreams of wealth would be shattered like before. In the last two decades of the twentieth century, Chinese people were thereby awakened to the sense of wealth again. Though such awakening seemed to be very quiet in China, it did bring about a very huge explosive force and shock the whole world. Many countries even cried with great sigh that they had underestimated China and already felt "Chinese threat". Besides, they also recognized that they had learned something valuable from China, that is, the industrious and fighting spirit of Chinese people, without which a nation would be defeated and wither in competitions.

The Chinese people's awakening to the sense of wealth has turned their practice of industrialization into a "miracle". Within just three decades, China has seen a rapid growth in industrial capacity, material wealth as well as financial wealth, and its image

[4]Cai (2015).

in the world has thereby been totally changed, too. "Chinese people" used to be a synonym for "poor people", but after thirty years' acceleration of industrialization, people tended to associate "Chinese people" with "rich people" and "man of means". Since then, more and more Chinese people are seen "spend money lavishly", and the nation's pace of wealth accumulation is also getting faster. It can be said that China is producing more and more "magnates" and "the second generation rich" at an astonishing rate. Besides, the world is also amazed by the rise of middle class in China. The statistics testifies to a dramatic rise in enterprise profits, a shockingly quick increase in government revenue and a growing tendency of family wealth accumulation.

Some scholars even concluded that China's industrialization had created a "land of wealth" with hundreds of millions of people, which can be comparable to Europe and the United States. According to some statistics, the number of Chinese "magnates" has ranked up top in the world, and China's net assets of urban households are approaching that of the United States very fast. Some scholar's study shows that median American net household assets is US$ 77,300 (roughly 470,000 RMB), and China's median net assets of urban households is roughly over US$ 66,300 (400,000 RMB).[5] Their figures are so close!

Industrialization has not only created huge wealth, but improved markedly people's physical fitness. According to some data, when the PRC was newly founded, China's per capita grain production was over 140 kg, while that of India over 160 kg; Chinese people's average life expectancy was 38 years, while that of Indians 41 years; China's rate of marketization was 13%, while that of India 17%; China's GDP per capita was 100 dollars, while that of India 170 dollars; China's electricity generation is 4300 gigawatt hours (GWh), while that of India 4.9 billion kilowatts; China's fertilizer output was 1/4 of that of India (5,000 tons and 20,000 tons respectively); China's steel output was 1/8 of that of India, China's cast iron output 1/7 of that of India, China's cement output 1/4 of India's, China's oil production half of India's, and China's railway mileage less than half of India's.

However, by 2010, China's meat consumption per capita had reached 60 kg, which has exceeded the world's average level (40 kg) and that of Japan (46 kg), whereas that of India was only 7 kg. Now, China's grain production per capita has reached nearly 400 kg, annual grain yields per hector 350 kg, whereas India's annual grain yields per hector is less than 100 kg.

The most important reason is that China's fertilizer industry, water conservancy and agricultural machinery industry have been far developed than that of India. China consumes 50 million-ton fertilizers annually, and nearly 30 kg fertilizers are used per hector; whereas India's per hector consumption is just less than 5 kg. It is China's industrialization that ensures the exponential growth of agricultural production. Half of China's grain is used to feed people, whilst the other half is used as fertilizers, which explains why Chinese people's annual meat consumption is 10 times more than Indian's.[6]

[5] Zhang (2015).

[6] Ren and Wang (2015).

By the twenty-first century, Chinese people's average life expectancy has reached 75 years, which is very close to American's, i.e. 78 years. In the developed regions of China, people's average life expectancy ranges from 78 to 82, while New Yorkers' average life expectancy is 79 years.

2.5 The History of Wealth Creation Has just Started

Creation and accumulation of wealth has its own laws. In particular, wealth can proliferate rapidly, but it would still depreciate or "shrink" if mishandled. Therefore, protection of property safety and creation of more wealth have already become important conceptual symbols for China's awakening to the sense of wealth. The 17th National Congress of the Communist Party of China officially proposed to "create conditions to make more people get property income", which is a big step in emancipation of old concepts and a great policy progress based on the keen observation of China's economy and society.

Actually, it is also a recognition of as well as an encouragement to the Chinese people that they should not only be labor-income earners and consumers whose living standards kept rising, but investors and wealth accumulators. That is to say, accumulation of private wealth has been clearly recognized as an important means to build up the nation's strength and enrich the people. Therefore, prosperity and power of socialist market economy has not only been reflected in the creation and accumulation of public wealth, but that of private wealth.

Since the reform and opening-up, acceleration of industrialization has turned China from a poor country into a middle-income country. But compared with other countries, China is still a developing country, whose per capita income level hasn't reached the world average yet, that is, just around two thirds to three fourths of the world average. It ranks nearly the 80th among over 200 countries/regions. According to the statistics from some department, China's GDP was 67.67 trillion RMB in 2005, which was roughly 10.42 trillion dollars according to the central parity of RMB against USD on December 3, 2015. The United States' GDP was 17.4 trillion dollars in 2014, and it increased by 2.7% in 2015 on a year-on-year basis according to the World Bank data. The US GDP added up to 17.87 trillion dollars in 2015, which is 1.7 times as much as that of China. In 2015, China's GDP per capita was 52,000 RMB (1.3 billion people were counted), which was roughly 8,016 dollars, far lagging behind developed countries such as the US., Japan, Germany and UK., whose GDP per capita was all well above 37,000 dollars. China's GDP per capita was just one fifth of that of the United States.

Therefore, the Chinese nation has no reason to feel self-complacent or arrogantly proud of their achievements over the past thirty years, such as acceleration of industrialization and high economic growth rate. The history of national renewal tells us that a country can never become a powerful one without several hundred years of hard struggle and wealth accumulation. China's history of wealth creation and accumulation has just started, and therefore China mustn't be conceited and carried

away by these achievements nor just stop right there; but instead, it should have a much clearer head and a more scientific attitude to build a more glorious wealth civilization so that the wheel of the Chinese nation's renaissance would continue to move forward.

What deserves more reflection is that China, regardless of its great achievements, has paid a very high price for industrialization. Although it is true that "there is no free lunch" and "everything has a price to pay", and China should be proud of its industrial achievements, such a huge price cannot afford to be ignored. In a fundamental sense, creation and accumulation of wealth is decided by the price that a nation is willing to pay. All the people now admit that China has indeed paid a high price for its super-high economic growth rate in the era of industrialization acceleration within over three decades, such as resource consumption, environmental damage, workers' physical health impairment and social polarization.

Even though the past development pattern can be justified by historical limitations, and we cannot blindly put it to blame without taking historical conditions into consideration, we mustn't let it repeat in the future. After its entry into the twenty-first century, China has come to realize that it must pursue sound development, focusing more on resource conservation, environmental protection, ethical treatment of employees and issues concerning the people's livelihood. A strong cry for sound development has been heard in recent years. China must learn from and correct the past mistakes while advancing industrialization and creating wealth. So far, China has made very remarkable historical progress and its industrialization has moved from the primary stage upward to the mid-advanced one.

Likewise, civilization also has a price to pay. As for resource conservation, environmental protection, ethical treatment of employees and focus on people's livelihood, "there is no free lunch" either. In order to fulfill a beautiful wish, one must pay a price or has to give something up. Therefore, before one promises to achieve a goal, he/she should be fully aware of how big a price might be and whether he/she can or is willing to pay such price. When China launched and promoted the reform and opening-up, Xiaoping Deng, the then top Chinese leader, had already known that a huge price might be paid for it. For example, he predicted that the policy of "letting some people and some regions get rich first" would lead to a large income gap and that would be the price China has to accept. But he also warned Chinese people of severe polarization, which would be too huge a price that China can not afford. If that really happened, the reform would definitely be a failure. China is currently in a stage when it must attach more importance to resource conservation, environmental protection, ethical treatment of employees and people's livelihood, and it is capable enough to make more commitments to address these problems as well. However, we must be fully aware of where the upper limit is, and keep asking ourselves whether the policies would work, otherwise we would have to pay a too huge price that we can hardly take.

In the long history of human development spanning thousands of years, the era of industrialization is a very special period of time, in which the material wealth that mankind has created even exceeds the sum of national wealth created prior to the Industrial Revolution. The mission of industrialization would not be completed

unless humans achieve material abundance. China is currently still far far away from achieving absolute affluence, and its ambitious goal is still to build a moderately prosperous society in all respects. However, after thirty years' high-speed industrialization, the wealth foundation that underlies China's economic and social development has radically changed. Thirty years ago, China was still a very poor country when it just began to carry out the reform and opening-up. Judged by today's standards, the great majority of the Chinese people at that time had no personal wealth at all, and "Ten-Thousand-Yuan household" was already something! Our current achievements in industrialization are the result of the deepening of the reform and opening-up after China has amassed a considerable amount of wealth. Seen from the wealth structure, these two periods' (i.e., the thirty years prior to the reform and opening-up and the thirty years since then) social conditions cannot be mentioned in the same breath at all.

After 30 years' acceleration of industrialization, China's form of wealth has changed dramatically. First, wealth owners are not just confined to the state and SOEs like before; rather, people have also begun to own more and more wealth. That is to say, China's wealth balance has shifted very obviously to private wealth. Some developed coastal regions begin to see an upward trend in people's wealth, including both wage-income and non-wage income. Second, private wealth used to display the features of "a flow", as it was mainly composed of current income rather than stock asset. People's savings mainly came from their income and were mostly used as "consumption funds (capital)"; in this sense, they contributed very less to accumulation of wealth. In contrast, the wealth possessed by people is now mainly composed of stock assets (family property); besides, the real property that people possess is also on the rise. That is to say, China's private wealth at present displays very strong features of "stock wealth". Third, wealth used to exist in physical forms, and it was particularly true of the meagre wealth possessed and accumulated by people. Now, not only the state and enterprises have colossal virtual assets, but the people have already possessed and amassed a lot of them. Therefore, the "virtualization" of wealth, or the increasingly higher percentage of virtual assets, is another distinctive feature of China's wealth form change.

As the wealth tends to be "privatized, stocked, and virtualized", the process of wealth formation is not only creation and accumulation of wealth, but represented as preservation and proliferation of wealth. Creation and accumulation of wealth would not be benign and sustainable, if it could not coordinate well with preservation and proliferation of wealth. That is to say, they are complementary in the process of wealth formation, and an injury to one is an injury to both!

Along with these changes, China's economic base for the reform and opening-up has also changed accordingly, that is, China's reform is now based on wealth rather than poverty. Private wealth is not mainly composed of "consumption funds" any more, but tends to be "privatized, stocked, and virtualized"; besides, wealth formation is now already a highly complex process consisting of wealth creation, accumulation, preservation and proliferation. At the same time, the social interest structure has also become pluralistic, differential, stratified and even conglomeratic as a result of these changes. Any economic phenomenon tends to influence different stake-holders in

different ways. For example, a rise in crude oil price rather than product oil will benefit the oil-extraction enterprises and consumers, but oil-processing enterprises and their stock-holders will be put in a relatively worse position. The rise in commercial housing price will be unfavorable to those who want to buy commercial houses, but beneficial to those who have already had them, especially those who have bought them on loan and the share-holders of real estate companies as well. People come to realize that there is less and less room for the so-called "Pareto improvement" (an action done in an economy that harms no one and helps some people improve their situations): when some people's welfare are improved (wealth growth), some other people's welfare will inevitably be reduced (wealth reduction). So, China's wealth-based reform will keep advancing in a society with an even more pluralistic and complex interest structure, which means that the dynamic mechanism for China's reform and opening-up has already undergone huge structural changes.

What is more important is that thirty years' reform and opening-up has given rise to massive productive forces and therefore formed a rather strong wealth base, which is however conditioned by one important thing, that is, China's factors of production have come into full play over these years. In other words, China has gained very strong competitiveness in terms of product price owing to their dependence on low-price resources such as natural resources, environment and labor. In this sense, it is huge inputs such as resources, environment and labor that have contributed to a large extent to China's wealth base over the thirty years. Therefore, regardless of whatever achievements China has made, such pattern of wealth creation and accumulation must be changed.

In view of this, the issue of "social responsibility" has thereby begun to attract more and more attention. People come to realize that only a responsible way of creating and accumulating wealth could lead to a truly sustainable wealth civilization. That is to say, wealth civilization must ensure that the interests of all parties concerned are considered: aside of being responsible for itself, it should also be responsible for stake-holders, society, future development and even the whole world. Therefore, on the one hand, creation, accumulation, preservation and proliferation of wealth must be in the final sense achieved through competition, as market economy involves fierce competition. Such mechanism of competition will not change and even might keep intensifying. On the other hand, modern wealth civilization needs a win-win or multi-win game, in which all interest groups will be satisfied one way or another. Only if the two aspects are both satisfied and well coordinated with each other, there will be a sound wealth base for the "Scientific Outlook on Development" and "A Harmonious Society". On basis of this, China proposed to pursue a new vision of "innovative, coordinated, green and open development that is for everyone".

Therefore, the current and future reform and opening-up will involve a more complex interest structure. How to take all groups' interests into consideration and restore balance to the relationships that are already or might be out of balance constitutes an enormous task for China, while it is trying to create a much greater wealth civilization in a new era. All in all, China's over thirty years' reform and opening-up is just a prelude to the rise of the Chinese nation.

Looking back on China's contemporary history of industrialization, we can see that the past over thirty years' reform and opening-up was a history of Chinese people awakening to the sense of wealth. Pursuit of wealth is the engine of development, as it has enabled China to break free of old ideologies and get rid of the previously-held idle, slack and dependence-on-others attitude and code of conduct. A more important reason why such awakening is of profound social significance is that the spirit of self-responsibility has already been formed in the whole society: everyone has to rely on their own efforts to live a decent life; anyone, who cannot create or accumulate (or inherit) a certain amount of wealth, will not maintain a steady or satisfying life (social welfare system can only cover the minimum cost of living).

Over the past thirty years, China's reform and opening-up has greatly liberated the productive forces as well as wealth-related behavior, having thereby created a huge market space with great potentials of wealth creation and proliferation. So, enterprises and investors from all over the world don't want to miss the wealth-seeking train to China. And this explains why China has today become a country to be reckoned with and won wide respect across the globe. Even hostile countries have to show "goodwill" and "respect" to China, as they, whether they like or dislike China, have realized and have to admit that their own national income, employment, supply and product market and even wealth proliferation are all closely linked with China. Despite ideological differences or incompatibility, wealth is too powerful to resist. It is unwise of a country not to cooperate with China or oppose China as it not only harms China's interest but puts itself in a worse position; and moreover, it is also a disregard for its own national interests. In this sense, China's awaking to the sense of wealth has set the stage for it winning the respect from the world.

Definitely, the awakening to the sense of wealth does not mean to encourage people to achieve the end through unscrupulous means, to be purse-proud, or to be rich and cruel; besides, any "wealth curses", such as "birds die in pursuit of food and human being wealth" and "money is the source of all evils", should not be turned into realities, either. The sense of wealth is the source of power for market economy, and the awakening to the sense of wealth is the manifestation of market economy's great creativity. But modern wealth civilization is not extreme individualism or egoism.

Under market economy rooted in the modern wealth civilization, pursuit of wealth is more than a spirit of self-responsibility, which means individuals should be well prepared for any challenge and competition and have the spirit of self-reliance, self-support and self-respect; besides, it should and must be a social responsibility, which means individuals should also be responsible for stake-holders, society and even the world while creating wealth. When we say creation and accumulation of wealth should be perpetuating and sustainable, it not only works for individuals, but for the society, the world and even the humanity.

References

Cai, F. (2015). The making of dual economy as a stage of economic development. *Economic Research Journal, 7,* 4–15.

Jin, B. (1993a). On private economic behaviors in socialist economy. *Social Sciences of Jiangsu Province*.

Jin, B (1993b, January 21). socialism is not 'selfless' economy. *Bulletin of Economics,*.

Ren, C. G., & Wang, W. (2015). Cannon and butter. *Observation and exchange* (Vol. 148, hosted by the Center for Chinese & Global Affairs of Peking University).

Zhang, W. W. (2015, April 2). A global perspective on China's path. *Guang Ming Daily*, 11.

Chapter 3
High-Speed Growth: Massive Economic Expansion Through Low-Cost Alternatives

Since when have Chinese people begun to scramble for things, being impatient and anxious for quick success? Nearly a hundred years ago when they visited China, most westerners were impressed by Chinese people's slow pace and leisurely manner, which was then more of a symbol of noble identity for the upper class. Napoleon Bonaparte also called China an "oriental sleeping giant". That is true. Chinese civilization is the only ancient civilization that has endured over thousands of years in the world, which is just like the spiritual turtle, a Chinese symbol of longevity, having no reason to rush. However, since the 20th century, Chinese people were suddenly awakened to their backwardness and felt it very urgent to catch up with the western countries, which had made great technological advances since the Industrial Revolution. Yat-sen Sun, the founding father of the Republic of China (1912–1949), proposed to "rejuvenate the Chinese nation" through revolutions. Chairman Mao (Zedong Mao), the founding father of the People's Republic of China (1949–), wrote in his poem, "Ten thousand years are too long; seize the hour!" Shortly after the founding of PRC, China proposed to "catch up with and even surpass the UK and the US", once believing that "the crop from the field is as large as guts can yield".

At the end of the 1970s, China entered the period of industrialization acceleration, in which Gross Domestic Product measured everything. The working ideals of governments at all levels were then that "each year things will improve gradually; three years later, things will change dramatically." In business circles, "fast fish eats slow fish" and "time is money and efficiency is life" were considered the most important principles for business management. All rankings were just based on the size and scale. High speed is good, but one tends to spoil things at a too high speed or with too much enthusiasm. It is understandable that people are eager to succeed, but excessive eagerness might corrode patience. It is also very natural that people like big things, but hugeness tends to invite more troubles.

From the founding of the People's Republic of China till the end of the 1970s, China, with one fifth of the world's population, just accounted for less than 5% of the world's GDP, so it is quite natural that China's economy grew very fast after China began to accelerate industrialization. In theory, the minimum requirement for

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national renewal is that China's share of world GDP must reach the same level as China's percentage of world population. When that day comes, China's GDP per capita will reach the world average level, its living standards will exceed the world average, and China will enter the ranks of rich nations, too. However, before that point, China's economic growth rate must remain remarkably higher than the world level.

In the period of industrialization acceleration, low income and low price remained one of China's realities; therefore, China must make full use of its low-cost comparative advantage to help achieve rapid economic growth. As far as the basic path of industrial development is concerned, China mainly used the "low-cost alternative" strategy to give full play to its comparative advantage, thereby rapidly forming production capacity, increasing the output and taking larger market share. In other words, China replaced high-cost products with low-cost ones and offered consumers a better price-performance ratio than competitors, thereby improving the competitiveness of Chinese industrial products in the global market. To sum up, high speed and large size were two main features of China's industrial development in this period.

3.1 Robust Industrial Growth Has Turned China into the World's Second Largest Economy

Since the founding of PRC in 1949, industrial development has become the most important economic task for China. That "agriculture is the basis of national economy and industry the leading factor in the national economy" has become the basic guideline for China's economic development since the 1950s. For a rather long period of time, at least until the end of 20th century, agriculture had been supporting industrial development under such guideline. In order to accumulate capital funds and provide cheap raw materials and labor for industrial development and thus realize "primitive accumulation" of industry, China had lowered the price of agricultural produce and used agricultural taxes for industrial investment and so forth. Besides, China's income distribution pattern was characterized by high accumulation in the era of planned economy (before the 1970s) and high savings rates and high investment rates in the era of market economy (after the 1980s).

According to the logic of development economics, the policy of prioritizing industry and an economy characterized by high consumption and high savings rates should have made China's economy "take off" very easily. However, China began to develop planned economy from the 1950s to the 1970s in hope of achieving a "planned and proportional" high-speed growth and a "great leap forward" in industrial development, but the result turned out to be the exact opposite of what China had expected, just as a Chinese saying goes, "more haste, less speed". Even though China's annual economic growth rate had reached as high as 12.9% from 1949 to 1978, it still produced very bad results, such as a serious structural imbalance of national economy, severe economic crises and problems concerning the overall situation.

Table 3.1 Gross domestic product index (the year of 1978 = 100)

Year	1978	1990	2000	2013	2014
GDP	100.0	282.7	762.8	2631.9	2823.2
The primary industry	100.0	190.7	275.4	462.8	481.6
The secondary industry	100.0	304.1	1080.5	4138.8	4441.1
The tertiary industry	100.0	363.5	964.5	3576.0	3856.6

(*Sources* National Bureau of Statistics of China, data.stats.gov.cn.)

Table 3.2 GDP per capita index (the year of 1978 = 100)

Year	1978	1990	2000	2013	2014
Index	100.0	238.1	577.6	1854.0	1978.7

(*Sources* National Bureau of Statistics of China, data.stats.gov.cn.)

At the end of the 1970s, China began to carry out a market-oriented economic structural reform and the reform and opening-up. By the end of the 20th century, China's annual economic growth rate had exceeded 15%. Such two-digit high-speed growth continued until the year of 2010.

Though China's industrial development has gone through many twists and turns over the past six decades, "high-speed growth" and "economic expansion" still remained its basic features. Especially since the 1970s, China has seen high-speed economic growth driven by its industrial growth. China's GDP in 2014 was around 30 times as much as that in 1978; the size of the secondary industry in 2014 was over 40 times more than that in 1978; and its GDP per capita in 2014 was also 20 times as much as that in 1978 (see Tables 3.1 and 3.2). In the past six decades, industry has undoubtedly contributed most to China's economic growth. According to statistics, there are more than 500 types of industrial products, among which 220 types rank number one in global output. If measured by GDP, China has already had the world's largest industrial output.

Since the 1990s, China has kept moving up in the world rankings in terms of the overall size of the economy (measured by GDP). At the beginning of the reform and opening-up, China was ranked No. 11. In the list of countries/regions by GDP in 1990, the United States was ranked number one, whose GDP was US$5.7548 trillion; Japan the second, whose GDP was US$3.1037 trillion; and China was No. 10, whose GDP was US$387.8 billion. By 2000, the United States still remained number one, whose GDP was US$9.8988 trillion; Japan was still the second, whose GDP was US$4.8490 trillion; and China rose to the third, whose GDP reached US$4.5320 trillion. In 2010, Japan's GDP was US$5.4742 trillion and China's US$5.8786 trillion, and thereby China became the world's second largest economy, just next to the United States.[1] Afterwards, China's overall economic size kept approaching that of the United States

[1]In January 2011, National Bureau of Statistics announced that Japanese GDP was US$5.4742 trillion in 2010, which was less than that of China (US$5.8786 trillion) published in January.

year by year, while Japan, which used to be the world's second largest economy, has farther and farther lagged behind China. By 2015, China's share in the global GDP had reached 15.5%.

By comparing the data of China's economic growth with those of India, we can see a tendency of acceleration in China's industrialization since the second half of the 20th century. In the 1980s, China's GDP was roughly at the same level with that of India; however, by 2000, China's GDP had already been 2.5 times as much as that of India; in 2010, China's GDP was four times as much as that of India; and by 2014, China's GDP was already five times as much as that of India.[2]

Accordingly, Chinese enterprises also expanded very rapidly. In 2015, 106 Chinese enterprises entered the list of "Fortune Global 500" (issued in July 2015), while the number of American enterprises in the list was 125, ahead of China just by a very narrow margin. For example, China Sinopec Group is the second largest enterprise just next to Wal-Mart. China Sinopec (No. 2), CNPC (No. 4), State Grid Corporation of China (No. 7) are all in the list of top 10. Therefore, judged from the size of enterprise, China is also the world's second largest economy.

While the size of both China's economy and enterprises grow rapidly, its employment rate is also increasing dramatically. In 1980, the numbers of employed workers were 423.61 million, including 105.25 million urban workers and 318.36 million rural workers. By 2014, the number of employed workers had reached 772.53 million, including 393.10 million urban workers and 379.43 million rural workers (see Table 3.3).

After over 60 years' development, especially acceleration of industrialization since the 1980s, China, which used to be very poor and backward especially in

Table 3.3 Employed population in China (unit: million persons)

Year	1980	1985	1990	1995	2000
Employed population	423.61	498.73	647.49	680.65	720.85
Urban employed population	105.25	128.08	170.41	190.40	231.51
Rural employed population	318.36	370.55	477.08	490.25	489.34
Total population at the end of the year	987.05	1058.51	1143.33	1211.21	1267.42
Year	2005	2010	2012	2013	2014
Employed population	746.47	761.05	767.04	769.77	772.53
Urban employed population	283.89	346.87	371.02	382.40	393.10
Rural employed population	462.58	414.18	396.02	387.37	379.43
Total population at the end of the year	1307.56	1340.91	1354.04	1360.72	1367.82

(*Sources* Annual data from National Bureau of Statistics, www.stats.gov.cn/tjsj/)

[2]According to China Statistical Yearbook (slightly different from the statistics provided by Baidu encyclopedia), China's GDP in 2014 was US$10.3601 trillion, and India's GDP was US$2.0669 trillion.

industrial economy, has successfully and undeniably become a strong economy by the first decade of the 21st century. Besides, China has the world's largest employed population of benefiting from industrialization, and no country is a match for China in this respect.

According to the statistics from the United Nations Industrial Development Organization (UNIDO), China currently ranks No.7 among 135 countries in terms of industrial competitiveness index, and first in net manufactured exports. According to the international standard of industrial classification, industry falls into 22 categories. China is ranked first in seven of them, and it also has the largest output of over 220 industrial products such as iron and steel, cement and automobiles.[3] It is reported that in 2013 China accounted for 59% of the global output of cast iron, over 50% of the global output of coal, 46.3% of the global output of crude steel, 41% of the global accomplished shipbuilding output, over 61% of the global output of cement, 65% of the global output of electrolytic aluminum, 35% of the global output of chemical fertilizers, 70% of the global output of chemical fiber, 50% of the global output of plate glass, 43% of the global output of engineering machinery, 25% of the global output of automobile, 48.8% of the global output of colored TV, and 70.6% of the global output of mobile phone.

China's top or world-class technologies include: LASER technology, super hybrid rice technology, ceramic technology, anti-satellite technology, bridge-building technology, plateau railway construction technology, giant hydropower station construction technology, drainage and irrigation technology, several intelligent robot technologies, hovercraft and water well drilling rig technology, silk making technology, desert reclamation technology, technology for prevention and control of plague and SARS, car battery technology, therapeutic hepatitis B vaccine technology, solar power technology, biofuel technology, conventional submarine technology, aerospace technology, coal-fired CHP (combined heat and power) technology, high speed rail technology, technology for low-speed magnetic levitation subway trains, quantum communication technology, hydrogen fuel cell technology, mobile communication technology, nuclear power technology, cloud computing technology, the internet of things technology, sensor network technology, super-giant wind-tunnel technology, hydraulic press technology, super computer technology, ultra-high voltage transmission technology.

China and the United States are the only two countries that have the most complete industrial system in the world. According to the UN standard, industry falls into 39 categories, 191 divisions and 525 sections, and China's industry covers all of them. Even though China's industry is large and extensive and has already had very advanced technologies in some respects, its average level and quality is still not high, and most industrial products are still at the low and medium end of industrial chain. According to *Made in China 2025*, an initiative to comprehensively upgrade Chinese industry, China's manufacturing is currently still 50 years behind that of the developed countries; China endeavors to take 30–35 years to enter the most advanced

[3] Ma (2014).

ranks of global manufacturing and become a manufacturing power with the world leading technologies, that is to say, to achieve the goal by the mid 21st century.

3.2 Industrial Growth Propelled by High Savings Rates and High Investment Rates

From the 1950s to the end of 1970s, China's strategy of industrialization was basically as follows: developing a highly closed economy, adhering to the principle of self-reliance in industrial development, and levying high tariffs and over-evaluating the Chinese currency to promote import substitution industrialization. Its industrial production mainly aimed to meet domestic demand, and goods were exported just for the sake of earning foreign exchange so that high-tech manufactured goods would be imported. After over 20 years' development, China has already had preliminary conditions for industrialization and established a rather complete industrial and economic system.

During this period, domestic market and international market were separated from each other, resource allocation was also divided. Manufactured goods made in China had little competitiveness while being exported overseas, so China's exports were then mainly primary goods, while its imports manufactured products.

By the end of 1970s, China's industrialization had undergone tremendous historical changes, which has brought a huge impact on the whole world and changed the world industrialization map. Since then, China began to replace import substitution industrialization with a new strategy, that is, to carry out the reform and opening-up, being committed to using both domestic and international markets and resources, especially encouraging introduction and use of foreign investment through preferential treatment policies, to promote export substitution industrialization by lowering gradually tariffs and depreciating massively Chinese currency (and using a double-track exchange rate system in a given time) and to accelerate industrialization.

Since the mid 1990s, China began to adopt a new strategy of industrialization, that is, to participate actively in the international division of labor and global competition, to integrate domestic market with international market (i.e., to open domestic market to the outside world and turn it into an integral part of the international market), and to promote internationalization of industrial economy by lowering tariffs continuously and using a managed floating exchange rate.

Since then, China began to fully use its favorable domestic factors relevant to international economy that is cheap labor, land and raw materials, to produce manufactured goods with comparative advantages for international exchange. The structure of imports and exports also began to change significantly: major exports have gradually changed from primary goods to manufactured goods. By the end of 1990s, exports had been mainly composed of manufactured goods. In 1980, primary goods

still accounted for over 50% of the total exports; but by 1999, the percentage of Chinese manufactured goods in total exports had risen to 89.8%; and in the 21st century, it has already exceeded 90% (see Table 3.4).

With the acceleration of industrialization and the deepening of economic structural reform, market economy has provided China's economy with a strong supplying capacity and thereby successfully got rid of economic shortage, which had been bothering almost all traditional economic fields for years, with the result that the historical missions of filling in and making up for the "gaps" and "drawbacks" of regular industries were by then all completed; all traditional industries have entered a new phase of maturity, and China has thereby become a great manufacturing power known to the world. Having totally put an end to the era of "shortage economy", China thereby grew from an agriculture-based country into an industry-based one.

Aside from the economic structural reform, the policy of opening-up and the change of industrialization strategy, another important cause for the rapid process of industrialization is that China has maintained high savings rate and high investment rate for long. This is a very rare phenomenon even on a world scale. In the era of traditional planned economy from the 1950s to the 1970s, China's economy had already maintained a rather high accumulation rate.[4] At that time, if the accumulation rate was higher than 25%, it would be considered "abnormally" high, and therefore people attributed people's low living standards to the policy of "high accumulation and low consumption". Since the end of the 1970s, economic theorists and decision-makers both suggested that, in order to carry out the reform and opening-up and to achieve the transition from a planned economy to a more market-oriented economy, the accumulation rate (savings rate and investment rate) should be reduced to the "reasonable level", i.e., around 23%.

However, it was not the economic reality. On the contrary, China's transition to a more market-oriented economic system led to a rise rather than a decrease in the savings rate and investment rate. By the end of the 1990s, the investment rate (the rate of capital formation) had ever exceeded 60%. Even though it dropped afterwards, it still remained at the high rate of over 45% for long (see Table 3.5), which no economic theories can explain. So far, all Chinese and foreign economists who study Chinese economy haven't reach a consensus on the reason of such strange phenomenon yet. The most popular explanation is that China's flawed social security system caused Chinese people "not to dare to spend"; some people said that governments and enterprises have got the lion's share of national income and the public sector especially SOEs has made up the bulk of the economy, so that consumption is suppressed; some other people also attributed it to social and cultural factors, believing that Chinese people are more inclined to accumulate wealth and hand them down to their next generations. Whether these explanations are reasonable or not, high savings rate and high investment rate are indeed very real and "stubborn" features of China's industrialization during that period of time.

[4]In the era of planned economy, China did not have any statistics on the savings rate; the "accumulation rate" issued at that time was roughly equal to the savings rate and investment rate.

Table 3.4 China's structure of imports and exports

Year	The structure of exports (%)		The structure of imports (%)	
	Primary goods	Manufactured goods	Primary goods	Manufactured goods
1980	50.3	49.7	34.8	65.2
1981	46.6	53.4	36.6	63.4
1982	45.0	55.0	39.6	60.4
1983	43.3	56.7	27.2	72.8
1984	45.7	54.3	19.0	81.0
1985	50.6	49.4	12.5	87.5
1986	36.4	63.6	13.2	86.8
1987	33.5	66.4	16.0	84.0
1988	30.3	69.7	18.2	81.8
1989	28.7	71.3	19.9	80.1
1990	25.6	74.4	18.5	81.5
1991	22.5	77.5	17.0	83.0
1992	20.0	80.0	16.4	83.6
1993	18.2	81.8	13.7	86.3
1994	16.3	83.7	14.3	85.7
1995	14.4	85.6	18.5	81.5
1996	14.5	85.5	18.3	81.7
1997	13.1	86.9	20.1	79.9
1998	11.2	88.8	16.4	83.6
1999	10.2	89.8	16.2	83.8
2000	10.2	89.8	20.8	79.2
2001	9.9	90.1	18.8	81.2
2002	8.8	91.2	16.7	83.3
2003	7.9	92.1	17.6	82.4
2004	6.8	93.2	20.9	79.1
2005	6.4	93.6	22.4	77.6
2006	5.5	94.5	23.6	76.4
2007	5.3	94.7	25.4	74.6
2008	5.4	94.6	32.0	68.0
2009	5.3	94.7	28.8	71.2
2010	5.2	94.8	31.1	68.9
2011	5.3	94.7	34.7	65.3
2012	4.9	95.1	34.9	65.1
2013	4.9	95.1	33.7	66.3
2014	4.8	95.2	33.3	66.9

(*Sources China Statistical Yearbook 2015,* National Bureau of Statistics of China data)

Table 3.5 Investment rate and consumption rate of China since 1978 (%)

Year	Capital formation rate (investment rate)	Final consumption rate (consumption rate)	Year	Capital formation rate (investment rate)	Final consumption rate (consumption rate)
1978	38.2	62.1	1997	36.7	59.0
1979	36.1	64.4	1998	59.6	36.2
1980	34.8	65.5	1999	61.1	36.2
1981	32.5	67.1	2000	62.3	35.3
1982	31.9	66.5	2001	61.4	36.5
1983	32.8	66.4	2002	59.6	37.8
1984	34.2	65.8	2003	56.9	41.0
1985	38.1	66.0	2004	54.4	43.0
1986	37.5	64.9	2005	53.0	41.5
1987	36.3	63.6	2006	50.8	41.7
1988	37.0	63.9	2007	49.6	41.6
1989	36.6	64.5	2008	48.6	43.8
1990	34.9	62.5	2009	48.5	47.2
1991	34.8	62.4	2010	48.2	48.1
1992	36.6	62.4	2011	49.1	48.3
1993	42.6	59.3	2012	49.5	47.8
1994	40.5	58.2	2013	46.5	51.0
1995	40.3	58.1	2014	45.9	51.4
1996	38.8	59.2			

(*Note* All the rates are based on the prices of the respective years. *Sources China Statistical Yearbook 2015*)

High growth rate driven by high savings rate and high investment rate is historically reasonable; in a given period of industrialization, it is also an advantage envied by developing countries. However, such "advantage" will become a "problem" if it exceeds the limit. Because it will lead to two results as follows:

First, it would lead to a gradual reduction in investment efficiency, i.e., a constant decrease in marginal productivity of capital (MPK). Some scholars calculated that the average MPK was around 0.5 from the 1980s to the 1990s, but it has reduced to 0.14 in 2014. That is to say, the current MPK is less than one third of that in the 1980s/1990s.

Second, in the real economic world, capital is always manifested in expansion of money input and social financing. High investment rates will surely lead to high debts and excessive expansion of money supply. It is estimated that since the beginning of the 21st century, China's "leverage ratio", i.e., the debt-to-GDP ratio, was 120% in 2002, 200% in 2014 (and some even estimated that it has already reached 260%), if

calculated by the ratio of indirect financing to GDP. To put it plainly, more and more money-capital is needed to fuel economic growth. According to Statistical Bulletin 2015 issued by National Bureau of Statistics of China, by the end of December 2015, total currency in circulation (M0) has amounted to 6.32 trillion RMB, narrow money (M1) 40.10 trillion RMB, and broad money (M2) 139.23 trillion RMB.

Since 2008, China's M2 has surpassed that of the United States, the largest economy in the world, and moreover, the ratio of M2 to GDP has begun to increase year by year as well. By the end of 2015, the ratio of M2 to GDP has reached 2.058 (see Table 3.6), which is far larger than that of most European countries (whose ratio is usually less than 200% and the US ratio is usually less than 100%). What is even more noteworthy, China's M2 will continue to grow at a higher rate than GDP growth rate, otherwise it will probably lead to deflation. China's government work report 2016 predicted that GDP growth rate would be 6.5 to 7%, and M2 growth rate would be 13%. Even though there are different understandings and explanations for China's such high ratio of M2 to GDP, it is undeniably true that China's economic growth is highly dependent on the increase in money supply.

3.3 Rapid Expansion of China's Industry in the Global Context

The hyper growth of China's industry is to a large extent due to the favorable international economic conditions. In the 1980s and 1990s, the world witnessed an economic boom after a period of "economic stagnation". Though a financial crisis broke out in East Asia in 1997, China was not affected very badly; rather, it has demonstrated its mainstay role and great economic strength in withstanding the severe crisis that has swept across East Asia. The period of time from 2000 to 2007 is a very rare "golden time" of global economy (until the breakout of 2008 global financial crisis, which will be later discussed). At that time, developed countries, emerging economies, and many developing countries such as BRICs all had a very strong momentum in economic growth. The economic situation then was very optimistic. Surely, China's high-speed economic growth in this period was also believed to be the strong engine of global economy. In other words, world economy has provided a great stage for China's high-speed industrial growth, and in turn, China's high-speed economic growth has expanded the world market and testified to the prosperity of global economy as well.

Industrialization is a global phenomenon. Any country's industrialization occurred in the context of global economy. China's high-speed economic growth since the 1980s was achieved as a result of it opening wider and wider to the outside world. In 2001, China was admitted to WTO, which has thus enabled China's industrialization to integrate with global economy. On the other hand, regardless of China's entry into the WTO, the international community still tended to "treat China differently" due to the great distinctiveness of China's industrialization. It can be

Table 3.6 China's ratio of M2 to GDP (1990–2015)

Year	M2 by the end of the year (billion)	GDP in absolute terms (billion)	M2/GDP
2015	139230.000	67670.800	2.0575
2014	122837.481	63591.000	1.9317
2013	110652.498	58801.876	1.8818
2012	97414.880	53412.304	1.8238
2011	85159.090	47310.405	1.8000
2010	72585.179	40151.280	1.8078
2009	61022.452	34090.281	1.7900
2008	47516.660	31404.540	1.5131
2007	40344.22	26581.030	1.5178
2006	34560.36	21631.44	1.5977
2005	29875.57	18493.74	1.6154
2004	25320.77	15987.83	1.5838
2003	22122.28	13582.28	1.6288
2002	18500.7	12033.27	1.5375
2001	15830.19	10965.52	1.4436
2000	13461.03	9921.46	1.3568
1999	11989.79	8967.71	1.3370
1998	10449.85	8440.23	1.2381
1997	9099.53	7897.3	1.1522
1996	7609.49	7117.66	1.0691
1995	6075.05	6079.37	0.9993
1994	4692.35	4819.79	0.9736
1993	3487.98	3533.39	0.9871
1992	2540.22	2692.35	0.9435
1991	1934.99	2178.15	0.8884
1990	1529.34	1866.78	0.8192

(*Source China Statistical Yearbook (1990–2015)* & *Statistical Communiqué of the People's Republic of China on the 2015 National Economic and Social Development*, National Bureau of Statics of China)

reflected not only in negotiation protocols on China's entry into the WTO, but in the handling of international economic affairs since its entry.

Though free trade is currently embraced as the basic principle, there are different rules for the international flow of commodities, capital, technology and labor. Great attention has been paid to the free flow of commodities and capital domestically and internationally, whereas the free flow of labor only applies to its own country rather than other countries; and moreover, the flow of Chinese labor has been given much stricter control by the international community. It can be said that the WTO rules, though based on the basic principle of free trade, do not support the free

international flow of labor. In other words, in the world economic order created mainly by developed countries, it is legal to prevent the international flow of labor, but illegal to prevent labor from flowing from one region to another within a country.

Under such international economic rules, China has to produce and export low-price industrial products in order to achieve international allocation of economic resources. Judge by economic rationality, the best way to improve the efficiency of resource allocation should be to ensure an absolutely free flow of all products, services and various mobile production factors (capital, technology, labor, etc.). However, as the international flow of labor is under strict control according to the current rules of international economy, it would be unlikely for China to mainly rely on the international flow of labor to optimize resource allocation. Therefore, aside from limited labor export due to contracting of international projects, most labor can hardly be re-allocated internationally, which has therefore led to China's severe difficulty in optimizing international allocation of resources. As a result, China has to find alternative ways to achieve this end, i.e., to massively produce labor-intensive manufactured goods to turn labor, which cannot flow freely internationally, into manufactured goods, which, to the opposite, can be sold freely across the globe. That is to say, China relies on international trade of manufactured goods to improve its efficiency of international allocation of resources (including labor). Accordingly, international trade especially export of manufactured goods will surely be a major part of China's industrialization; in other words, China's industrialization will be highly dependent on international trade. Besides, "processing trade" will make up a large part of China's import and export trade over a fairly long period of time. In a certain sense, the economic function of processing trade is exportation of labor.

In view of its extremely large population and low-level industrial technology, China had to produce massively mid- and low-end manufactured goods, trying to use low-cost alternatives to gradually enhance production capacity and enlarge the market share in the primary and middle phase of industrialization. As far as its domestic market is concerned, Chinese residents' income level and income distribution structure (in China, the percentage of low-income people is abnormally high, while "middle-income people" are just a few) determine Chinese industrial products' "good quality and inexpensiveness", that is to say, a lower price-performance ratio defines Chinese products' market competitiveness. From the perspective of global market, the comparative advantages of industrial products made in China matter even more to China. Therefore, the "price war" is inevitable in a certain stage of China's industrialization, and even high- and mid-end products could hardly bypass it, because the "low-cost alternative" is the basic means as well as the technical "shortcut" for these products to occupy larger market.

In the domestic market, almost no manufactured goods, ranging from daily necessities to domestic appliances such as color TV, VCD player and microwave, from cars to mobile phones, could escape the fierce (and even cruel) competition of "price reduction" since the 1980s. While in the foreign market, "Made in China" is almost the synonym of cheap products. The distinctiveness of China's industrialization determines that lower price would remain the largest advantage of Chinese products for long. In August 2001, Japan External Trade Organization (JETO) surveyed the prices

of domestic appliances in each Asian country and found out that products with the lowest prices such as color televisions, air conditioners, refrigerators, and electric rice cookers are all made in China. Due to the price war in China's domestic market, Japan, South Korea, Europe and the United States have to sell some of their products at lower prices in China than in other Asian countries, unless China is to levy high import tariffs.[5]

On the one hand, low income per capita requires inexpensive and high quality manufactured goods; on the other, the infinite supply of labor inhibits wage rise, i.e., an increase in labor cost, and therefore, many high-quality products could still be massively produced and supplied at lower prices. Since the 1980s, the world was amazed by Chinese manufactured goods' incredibly low prices. In the market of mid- and low-end manufactured goods, no product is a match for low-cost products made in China. One of the fundamental reasons is that China has a huge population and thus large human resources, i.e., the "demographic dividend" put forward by the economists. And moreover, as the economic structural reform moves further forward, China has gradually loosened its control over migration, which has enabled workers to freely migrate from region to region and thereby caused an endless flow of low-wage workers to the concentrated areas of industrial production. Low-cost manufactured products, determined by both low-price resources and other factors mentioned above, are the most outstanding feature of China's economy at the turn of the century.

According to the survey conducted by JETO in the 1990s, as for the total cost of electricity (in kilowatt hours) compared with Yokohama, the ratio of Shenzhen to Yokohama was 75%, that of Shanghai and that of Beijing were both 50%, that of Bangkok 28.6%, that of Kuala Lumpur 35.7%, that of Jakarta 19.4%, and that of Manila 27.5%; as for the petrol price (per liter), Shenzhen's was 51.7%, Shanghai's 40.7%, Beijing's 46.5%, Bangkok's 96.5%, Kuala Lumpur's 36%, Jakarta's 14%, Manila's 43.5%; as for the factory rentals per square meter compared with Yokohama, the ratio of Shenzhen to Yokohama was 2%, that of Shanghai 1.6%, that of Beijing 3.9%, that of Bangkok 3%, that of Kuala Lumpur 4.8%, and that of Jakarta 5.5%. Compared with Japan, China's labor price is only one tenth of that of Japan.

After China's entry into the WTO, China's inexpensive high-quality products penetrated the global market very rapidly. According to the survey conducted by Japan's Ministry of Economy, Trade and Industry at that time, Chinese moto bicycles accounted for 43% of the global output, computer keyboards 39%, household air conditioners 32%, washing machines 26%, color television 23%, chemical fiber 21%, and refrigerator 19%.[6] China's high-speed industrial growth has turned many places in China especially eastern regions into industrial centers and bases, which is very rare in the history of world industrial development.

Owing to their advantages, i.e., low prices and low costs, Chinese industrial products' production capacity and market share kept expanding with strong momentum until the second decade of the 21st century. From 1979 to 2012, export of Chinese

[5]Masaruro (2002).

[6]Cited from Wu (2002).

Table 3.7 2016 Global manufacturing competitiveness index (Top 10)

2016 (Current ranking)			2020 (Forecast ranking)		
Rank	Country/region	Index score	Rank	Country/region	Index score
1	Mainland of China	100.0	1	United States	100.0
2	United States	99.5	2	Mainland of China	93.5
3	Germany	93.9	3	Germany	90.8
4	Japan	80.4	4	Japan	78.0
5	South Korea	76.7	5	India	77.5
6	United Kingdom	75.8	6	South Korea	77.0
7	Taiwan (China)	72.9	7	Mexico	75.9
8	Mexico	69.5	8	United Kingdom	73.8
9	Canada	68.7	9	Taiwan (China)	72.1
10	Singapore	68.4	10	Canada	68.1

(*Source* 2016 Global Manufacturing Competitiveness Index)

goods grew at the rate of around 20% annually, which has enabled China to grow rapidly into a global trading power. China accounted for less than 1% of world exports at the very beginning of the reform and opening-up, over 5% in 2002, and over 12.3% in 2014.

According to the appraisal by international organizations, Chinese manufactured products, with the comparative advantages of low price, low cost and large-scale production capacity, were ranked first in terms of global competitiveness from 2013 to 2015. However, such advantage began to be relatively weakened since the second decade of the 21st century. According to the 2016 Global Manufacturing Competitiveness Index (GMCI) report prepared by the Deloitte Touche Tohmatsu Limited (DTTL) Global Manufacturing Industry Group and the U.S. Council on Competitiveness, China was ranked first and the United States second in 2016. It is predicted that the United States will overtake China and rank first by 2020 (see Table 3.7).

According to the analysis of this report, the top three competitive countries in infrastructure are Germany, the United States and Japan; in talent, the top three are Germany, Japan and the United States; and in terms of manufacturing labor cost, emerging economies still have the largest advantage, mainly because their workers' average salary is rather low. For example, in 2015, average hourly earnings of India and China were just US$1.7 and US$3.3 respectively, whereas that of the United States was US$38 and that of Germany US$45.5. However, in terms of workforce productivity, developed economies are even better: The United States is far ahead of other countries, and the next three are Germany, Japan and South Korea; but in the trend of future development, China and India have a larger acceleration than other countries, whereas Japan and Germany will be affected by the ongoing decrease in workforce and population aging. In terms of physical infrastructure, the top three are

Germany, the U.S. and Japan; in terms of logistics performance index (LPI), Germany ranks first; Japan tops the list of countries with the highest internet penetration rates.[7]

3.4 "Overcapacity" and Environmental Pressures

Since the second half of the 20th century, the process of China's industrialization has been highly condensed. Just within a short period of time, it has managed to shift to a totally different economic system, which is almost the opposite of the previous one. In the 1970s, China still suffered a severe economic shortage. However, in the 1990s, what inhibited China's industrial growth was not insufficient supply any more, but weak effective demand instead. At that time, unprecedented large-scale overproduction occurred in China. More and more industries came to realize that an increase in production is not good news any more, but instead to scale back production will necessarily improve the situation. For example, the coal industry closed some mines and reduced production; the textile industry reduced spinning spindles; metallurgical, building materials, non-ferrous metal and petrochemical industries closed many small high-polluting, high energy-consuming enterprises with obsolete equipment, backward technology, and low-quality products. As a result, many traditional industries began to see a slowdown in growth and some even experienced negative growth, which is typically reflected in a steep fall in the nationwide energy demand and production. For instance, from 1998 to 1999, the total energy production reduced by 11.3% and the output of raw coal decreased by 16.4% (see Table 3.8).

In times when China's economy suffered huge overcapacity, weak effective demand and economic slowdown, there was an urgent need to promote economic restructuring including industrial structural adjustment. Therefore, the central government proposed that industrial structural adjustment should strive for structural upgrading, improvement of quality and benefits, and enhancement of global competitiveness. It should focus on the following four major aspects:

Table 3.8 Negative growth of energy production in 1999

Product	Output in 1998	Output 1999	Growth rate in 1999 (%)
Total energy production (billion metric ton of standard coal equivalent)(tce)	1.24	1.10	−11.3
Raw coal (billion-ton)	1.25	1.045	−16.4
Crude oil (billion-ton)	0.16	0.16	−0.1

(*Source China Statistical Yearbook* 1999; "Statistical Communiqué of the People's Republic of China on the 1999 National Economic and Social Development", *Economic Daily News*, February 29, 2000)

[7] finance.ifeng.com, April 28th, 2016.

First, comprehensive ways should be used to limit production of goods that find no market. Small high-polluting, high-consuming plants and mines with backward technology and poor quality products should be closed; obsolete equipment and backward technology and technique should be eliminated; and excess capacity of some industries should be reduced.

Second, enterprises should speed up technological transformation, apply advanced standards, and update and optimize their product mix. Enterprises should try to develop new technologies, new techniques and new products that are greatly needed; besides, they should also be encouraged to increase the output of marketable goods especially brand-name, high-quality products.

Third, China should encourage the development of emerging industries and high-tech industries, especially information, biological engineering, new energy, new material and environmental protection industries. At the same time, great attention should also be paid to labor-intensive industries, which also have a large market.

Fourth, China should promote industrial restructuring and encourage key industries to achieve economies of scale and to optimize the layout. It should try to improve technologies of basic materials production in major equipment industry, develop the tertiary industry, and optimize the economic structure. While continuing to develop transportation, trade and commerce, China should also develop vigorously information, finance, tourism, community service, intermediary services, etc. in order to increase gradually the proportion of the tertiary industry in the national economy.[8]

What happened in the 1990s and how the government responded seemed to have occurred many times afterwards (until the second decade of the 21st century), each time giving people the sense of déjà vu. Here, we can call each similar set of economic countermeasures a cycle, which goes like this: stimulating growth (selective encouragement)—overproduction—regulation (selective cutback)—stimulating growth (encouraging new industries selectively)—overproduction—re-regulation (cutting overcapacity and reducing excess inventory). However, some subtle changes also take place each time the government has to adjust industrial structures to reduce overproduction. For example, in the past when China used to be a shortage economy, it was easy to tell "long-term" industries from "short-term" industries: the former are usually less profitable, while the latter ensure high profitability. Therefore, the government just needed to rebalance the two industries when necessary. Yet things have changed since the 1990s. Most traditional industries have since then been reduced to "long-term" ones because of their technology as well as demand and supply. Therefore, industrial restructuring from then on is more than rebalancing long-term industries with short-term ones, as the logic behind it has also changed accordingly.

In the past, enterprises (or local governments) tended to invest in profitable industries, that is to say, their money would go wherever they can make more money. But now, things have changed: enterprises tend to invest hugely in industries (mainly high-tech industries) that seem not to be very profitable at least for the present (as for whether these businesses will be profitable in the future, they are not even very sure

[8] See: "Government Work Report" made by former premier Rongji Zhu on the third session of the Ninth National Congress of the CPC, *Guang Ming Daily*, March 17, 2000.

about it, either); and more importantly, the government also supports these industries. All this is mainly due to the general belief that these businesses promise profits in the future and that investors will get their fair share by then. Such investment behavior seems like speculation, but it is, as a matter of fact, a decision influenced by industrial restructuring. However, policies on industrial restructuring might sometimes be a "misjudgment"; even the government will probably misjudge the situation and make wrong decisions in selective encouragement and cutback. Besides, industrial restructuring guided by market force might lead to an imbalance between supply and demand as well.

Now, people's anticipation matters more to the pattern of industrial restructuring; besides, the influence of profitability and all links in the industrial value chain on the decision-making of industrial structuring has also changed. That is to say, the new stage of industrialization begins to see a greater influence of "capital operation" and "venture capital", and therefore, the traditional way of industrial restructuring does not work any more. Rather, industrial restructuring and upgrading is more related to technological innovation path and financial innovation.

So, here comes the problem. When the government steps into address serious overcapacity and structural imbalance, can it judge the situation well? If not, should it stay away from this? This is an industrial policy issue with symbolic and practical meaning. As a matter of fact, even if the government cannot be one hundred percent sure of their judgment like what they did in the era of planned economy, they are still confident that they can guide industrial restructuring in the right direction.

Another major trend symbolizing a turning point for China's industrialization is that the issue of sustainable development centering on environmental protection has attracted more and more attention from the society. Since the late 1990s, China has begun to reflect on the environmental damage and question the value of industrialization in the past. In the future, China will be more aware of social cost and make sure its industrialization is environmentally bearable. The quality of life (including environmental quality) and the sustainability of economic growth will become the increasingly important measurement of economic performance. Some scholar had already pointed out then very sharply that China's rapid expansion of industrial production would lead to seven severe environmental problems. They are as follows: first, soil erosion would be increasingly worsened; second, deserts would expand; third, forest volume would decline drastically; fourth, grassland degradation, desertification and alkalization would increase year by year; fifth, natural disasters would increase; sixth, air pollution would be very serious and the acid rain affected areas would expand; seventh, water pollution would get worse and thereby lead to more severe water shortage.

Since the late 1990s, great damages that industry brought to the environment have already been felt, and environmental pollution also intensified in Chinese cities. According to a World Health Organization survey, the cities with the worst air quality across the world are Taiyuan (capital and largest city of Shanxi province in China), Milan (a city in northern Italy), Beijing, Urumqi (the capital of the Xinjiang Uygur Autonomous Region in China), Mexico City, Lanzhou (capital and largest city of Gansu Province in Northwest China), Chongqing (a major city in southwest China,

one of the municipalities under the direct administration of central government), Jinan (capital of Shandong province in Eastern China), Shijiazhuang (capital and largest city of North China's Hebei Province) and Tehran (capital of Iran) in descending order. Among the ten most polluted cities, seven are Chinese cities. According to an air quality test conducted in 322 cities all over China in 1988, the air pollution level of 140 cities (which accounted for 43.5% of all cities) had already exceeded the third national level, i.e., lightly polluted. According to the calculus of World Bank, if measured by the value of human capital, the value loss directly caused by China's air and water pollution is 24 billion US dollars, which accounts for 3.5% of China's GDP; but according to some scholars, if assessed by the value of willingness-to-pay, the value loss directly caused by China's air and water pollution is roughly 54 billion US dollars, which accounts for 7.7% of China's GDP.[9]

In view of serious environmental pollution and ecological damages, the government mapped out a plan on pollution remediation and ecological restoration. Under such policies of environmental and ecological protection, stricter and stricter restrictions were imposed on industrial development, for example, bans were already placed on high-polluting and most ecologically unfriendly industrial projects. However, till the first decade of the 21st century, local governments were still in a dilemma of choosing whether to mainly pursue industrial growth or to focus on ecological protection. Especially when China's economy enjoyed high growth, high energy-consuming and high-polluting traditional industries expanded very rapidly, but the policies of scaling back production were often met with severe setbacks. Therefore, whether China's industrial development could get away from the extensive growth mode, which has led to severe environmental damages, and turn to a green, energy-conserving, environment-friendly, low-carbon, and sustainable growth mode is a major strategic issue concerning the outcome of China's drive for industrial modernization.

While China's industry saw a high-speed growth and rapid expansion owing to its comparative advantage, it was also confronted with huge environmental pressures, which actually is a matter of industrial global competitiveness. The so-called comparative advantage gained at the expense of environment suggests nothing but a lower competitiveness. People have come to realize whether China could become a strong industrial power is finally determined by the competitiveness of its industry and industrial enterprises. China does boasts a large-scale industry, but it is definitely not a strong industrial power yet; just to the opposite, China's industrial technology is rather backward, which is well reflected in severe environmental damages caused by its industrial activity in the past several decades. That is to say, China still has a long way to go before it becomes a strong industrial power. In order to grow from a large industrial power to a strong industrial power, China must strive to make its industries more globally competitive, which, from the perspective of globalization, has become a decisive factor for the success of China's industrialization and modernization. While China's industrialization is entering a new phase, the competitiveness

[9]Hu (1999/2000)

of Chinese industries and enterprises is also undergoing drastic changes: the industrialization relying mainly on low-cost alternatives to gain competitiveness is now becoming a thing of the past, and new ways to enhance the global competitiveness of Chinese industries and enterprises will surely and must be found in order to further advance China's industrialization.

References

Hu, A. G. (1999 winter & 2000 Spring). Major challenges for human development in China's reform. *Chinese Social Sciences Quarterly (Hong Kong)* (Vol. 28, 29). Hong Kong Social Sciences Press.

Masaruro, M. (2002). Chinese economy's rapid development and Asia's countermeasures. *China's Opening Journal*, *2–3*.

Ma, J. T. (2014, September 24). China's history of hard struggle to success within 65 years—to mark the 65th anniversary of the founding of the People's Republic of China. *People's Daily*.

Wu, J. A. (2002). Prospect of Sino-Japan economic and trade relations in the new century. *China's Opening Journal, 2–3*.

Chapter 4
Back to the Normal: The End of History for Hyper Growth

Taking into consideration both domestic and international situations since the breakout of global financial crisis in 2008, China declared in 2014 that the Chinese economy had entered a "new normal", which has thereafter become a "key word" in China's new phase of industrialization. One of the distinctive features of China's "new normal" of economic development is that, compared with the first thirty years of reform and opening-up, its economic growth has sharply slowed: the annual growth is now just around seven percent down from two-digit numbers, even with the possibility of a further slowing in future. By the "new normal", it means that China has entered a "normal of slow growth", but it does not mean that the pace of industrialization should thereby slow. Rather, its industrial structure must be upgraded quickly from the medium-low end to the medium-high end; its income level must improve quickly to avoid "the middle income trap"; a moderately prosperous society in all respects must be built by 2020 (some developed provinces have even planned to achieve it ahead of schedule); poverty must be wiped out quickly so as to win the battle against poverty on schedule; technological breakthroughs must be made quickly so that China will achieve innovation-driven development and become an innovative country as soon as possible.

All in all, just because its economic growth has slowed down doesn't mean that China's desire and determination to accelerate industrialization will thereby been weakened. In order to find a new development path and mode in this transitional period of industrialization, China must, on the one hand, avoid the "anxious-for-success" and "ready-to-take-whatever-it-takes" mentalities while expanding production, and on the other, strive to achieve high-quality development in better ways. That is to say, instead of conflicting with each other, China's slow growth and desire for acceleration of industrialization should be highly compatible. To seek such compatibility has become a great challenge for China, just like "the riddle of sphinx" that has to be answered at the turning point of history.

Given the circumstances, China had no alternatives but to embark on reforms and innovation at a "steady" pace. If the short-term "slow growth" means to readjust the economy, achievement of long-term goals is expected to bring about real historical

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progress. Even though there is inevitably a period of time when readjustments must be made by slowing down economic growth, what can really shine through the history is the accomplishment of the ultimate goal.

4.1 A Transition from Hyper Economic Growth to a "New Normal"

Since the 1980s, the most distinctive feature of China's economic growth has been the fast speed, with the annual GDP growth rate being always significantly higher than the global level. Even when China saw an economic downturn in the second decade of the 21st century, its economic growth rate was still higher than that of most countries. Seen from statistics, in 2015, China's GDP growth rate was 3.1% higher than the global rate (see Fig. 4.1). That year, China's GDP growth rate was 6.9%, the United States 2.4%, the Euro-zone 1.6%, Japan 0.4%, Brazil −3.85%, Russia −5.3%. Only India's GDP growth rate was then 7.6%, slightly higher than China's.

Since the founding of PRC, the main driving force behind China's economic growth has been industrial production. Since the reform and opening-up, China's high-speed economic growth was still mainly driven by industrial production. China's industrial growth rate is usually 2–3% higher than GDP growth rate (see Fig. 4.2). Industrial growth is a major contributing factor to China's economic growth, that is to say, the secondary sector of the economy consisting mainly of industry has for long been the largest contributing factor to the high GDP growth rate among the three major sectors of the economy.

Since the global financial crisis in 2008, China has seen an obvious decline in economic growth rate. Especially since 2011, its annual GDP growth rate decreased year by year, with the two-digit growth recorded in 2010 having fallen to a single-digit next year (9.30%), and further falling to around 6% in 2016 (see Fig. 4.1). The

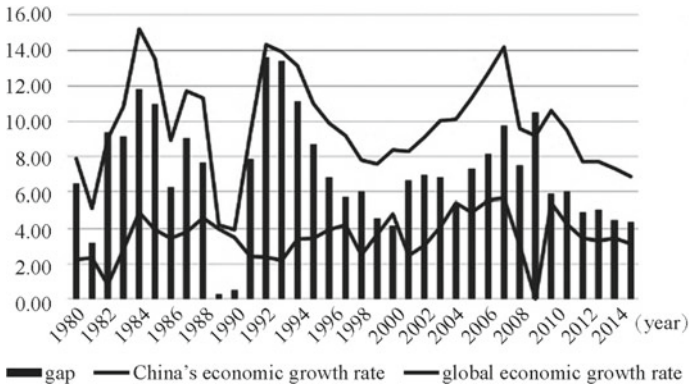

Fig. 4.1 Comparison between China's economic growth rate and global economic growth rate (%)

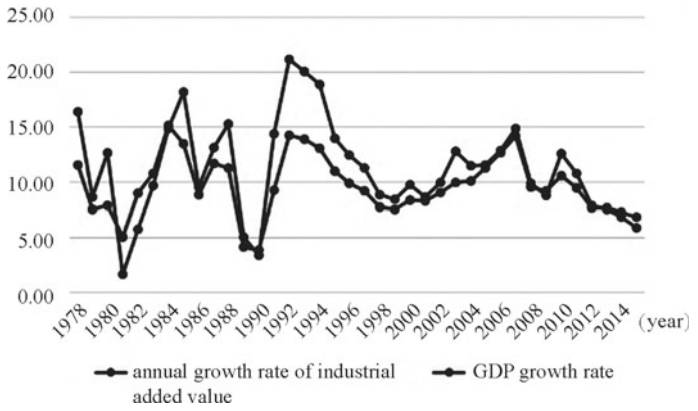

Fig. 4.2 Comparison between industrial added value growth rate and GDP growth rate (%). *Source* Wind Economic Database

biggest contributing factor to this is the decline in industrial growth rate. Since the 1990s, China's industrial economy has been growing at a very high speed, but the added value growth rate of enterprises above designated size in 2012, 2013, 2014 and 2015 has declined to 7.9%, 7.6%, 6.9% and 5.9% respectively, being 2.9%, 3.2%, 3.9% and 4.9% lower than that of 2011. Though it is still within the range of medium to high-speed growth, China's industrial added value growth rate has reached the lowest point ever since 1992.

According to statistics, in 2014, it is for the first time that China's industrial growth contributed less to GDP growth than the tertiary industry did (see Fig. 4.2), which proves that the industrial growth rate has "fallen to a lower level". And moreover, it continued to fall in January and February 2016 (see Fig. 4.3), with the added value of enterprises above designated size growing just at the speed of 5.4% per month,

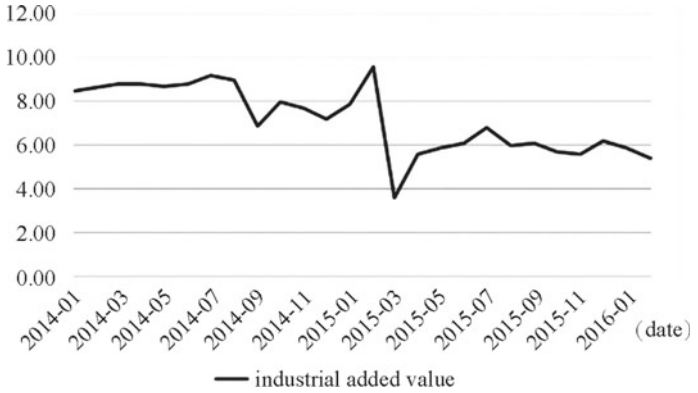

Fig. 4.3 Month-on-previous-month added value growth rates of enterprises above designated size (%). *Source* Wind Economic Database

Table 4.1 Annual GDP growth rate

Year	GDP growth rate (%)	Year	GDP growth rate (%)
2001	8.30	2009	9.21
2002	9.08	2010	10.45
2003	10.03	2011	9.30
2004	10.09	2012	7.65
2005	11.31	2013	7.67
2006	12.68	2014	7.40
2007	14.16	2015	6.9
2008	9.63	2016 (the first quarter)	6.7

Source http://www.stats.gov.cn/: state statistics—national economic accounting annual data/quarter data

lower than the average level in 2015. It shows that China's industrialization has definitely entered a new era, cyclical factors without being ruled out. But it did appear to be more dramatic in the aftermath of the 2008 global financial crisis (Tables 4.1 and 4.2).

Viewed in a longer run, global economy witnessed, as some economists put it, a "Great Moderation" from the mid- to late- 1980s till the breakout of global financial crisis triggered by the US subprime mortgage crisis of 2007. Especially from 2002 to 2007, the world enjoyed an economic "Golden Age" with rare prosperity and high economic growth. During that time, except a few countries such as Japan, most economies, including developed countries (e.g., the United States, European developed countries), emerging economies and developing countries, grew at a rather high speed; China's high-speed economic growth was then the powerful engine of global economic growth. However, such golden period was abruptly interrupted by the breakout of global financial crisis.

Notwithstanding this, up until 2010, most people still believed that the economic downturn caused by the global financial crisis was merely a cyclical phenomenon, and that the joint use of macroeconomic stimulus by all governments will prevent all economies from declining in a free-fall style, so that global economy would soon pick up and get back to the previous high-speed growth before 2007. Therefore, for the first time ever in human history, all major countries attempted Keynesian stimulus to deal with the sudden global financial crisis. It did yield some good results and last for a while, but failed to bring a rapid economic recovery or growth as expected. Instead, global economy still remained lackluster in the post-financial crisis era.

Against this backdrop, China's economic growth attracted particular attention. Around 2011, China came to realize that its economic slowdown, i.e., a fall from a two-digit growth rate to 7–8% and an even lower one is not cyclical, but structural. That is to say, China's economic fundamentals have undergone substantial changes; instead of continuing to grow at a super high speed, its economy has automatically entered a "new era" or a new stage of economic development. This stage will see a

Table 4.2 Contribution rates of three major industries to GDP growth

Year	Primary industry	Secondary industry	Tertiary industry
1995	8.7	62.8	28.5
1996	9.3	62.2	28.5
1997	6.5	59.0	34.5
1998	7.2	59.7	33.0
1999	5.7	56.8	37.5
2000	4.2	59.5	36.3
2001	4.7	46.2	49.1
2002	4.2	49.2	46.6
2003	3.1	57.9	39.0
2004	7.4	51.7	40.9
2005	5.3	50.3	44.4
2006	4.4	49.5	46.1
2007	2.7	49.9	47.4
2008	5.3	48.4	46.3
2009	4.1	51.9	44.0
2010	3.6	57.2	39.2
2011	4.2	51.5	44.3
2012	5.3	49.3	45.4
2013	4.4	48.0	47.6
2014	4.8	47.1	48.1

Source http://www.stats.gov.cn/: state statistics—national economic accounting annual data/quarter data

series of new, long-run phenomena and changes affecting the whole landscape: its economic development will get on a new track and find new drivers; governments, enterprises, citizens will have to change their concepts and make new moves. All boil down to "the New Normal" of economic development.

From then on, typical features of China's industrialization would undergo significant changes. For example, low cost has remained for long one of China's key weapons to win global manufacturing competitions; however, such advantage has gradually diminished since the second decade of the 21st century. In many regions of China, especially the eastern region, the wage level has far exceeded that of Southeast Asian countries. According to the survey (Dec. 2013–Jan. 2014) conducted by Japan External Trade Organization (JETRO), the monthly salary of average Shanghai workers was US$495, which is respectively 1.15 times, 2.15 times, 1.88 times, 1.35 times, 3.19 times, 4.9 times, 6.97 times, 5.76 times, 2.2 times, 2.38 times, 3.21 times, 3.8 times as much as that of Kuala Lumpur, Jakarta, Manila, Bangkok, Hanoi, Phnom Penh, Yangon, Dhaka, New Delhi, Mumbai, Karachi and Colombo. Moreover, China's manufacturing is also losing its sharp edge to developed countries such

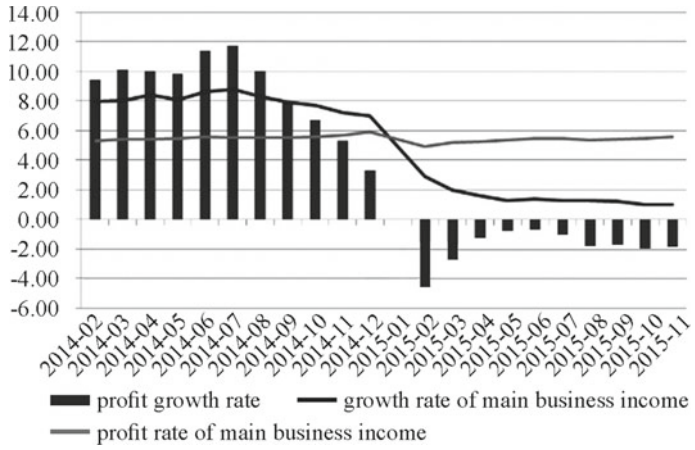

Fig. 4.4 Profits of enterprises above designated size (%). *Source* Wind Economic Database

as the United States. Even though China is still outdoing the United States in labor costs, its land costs, logistics costs, capital costs, energy costs, and accessory costs are all higher than that of the United States.

Besides, China's industrial development has for years benefited from the expansion of global market (demand). However, since 2014, especially 2015, things began to change significantly. Shrinking global market demand was one of the major causes for its decline in industrial economic growth rate; besides, it also led to a steep fall in China's domestic demand and a slump in investment, consumption and net export growth rate. The average growth rate of total investment in fixed assets in the whole society was 21.23% during the decade 2003–2013, 14.79% in 2014, and only 10.18% in 2015. The total retail sails of consumer goods grew at an average rate of 12.57% from 2003 to 2013, 10.90% in 2014, 10.60% in 2015. The average growth rate of imports and exports (general trade) was 22.29% from 2003 to 2013, 5.28% in 2014, and −7.47% in 2015. The average growth rate of imports and exports for processing trade was 15.59% from 2003 to 2013, 3.84% in 2014 and −11.64% in 2015.

Industrial enterprises found it quite hard to adapt to the "new era" at the very beginning, which was directly reflected in the decline in their profitability (see Fig. 4.4).

4.2 The "New Normal" of Economic Development from a Long-Term Perspective

As China's economy has entered a new stage, which is strikingly different from any stages before, economic development under the "new normal" has become the most heated issue in academic economics since 2014.

Based on the theory of knowledge, the "new normal" of economic development is essentially a realistic portrayal and theoretical summary of long-run phenomena and historical features at a certain stage of economic development; and the "knowledge" to be studied is the generally "normal" phenomena within a certain historical period determined by the objective laws of economic development. The so-called "normal" phenomena actually refer to the common things, "the majority", or "high probability" events in a long period of time. Therefore, in order to observe and study the "new normal" in economic development, we need take a longer-term perspective and study the phenomenon in a longer time span, and even draw on the findings of researches on the economic history spanning a very long time. That is to say, we need to observe normal phenomena that an economy is to undergo in a given long period, say, in the next several decades, especially some new phenomena that has never happened.

On a world scale, human development is currently in the phase of industrialization, which has lasted over two hundred years. Despite many industrial revolutions, most countries haven't finished industrialization so far. Since the 18th century, the first, second and third industrial revolutions had, in their particular ways, driven economies to grow at a much higher speed than before, so they are also called by some scholars sweeping "waves" of human development. Viewed from the trend of human development in the long run, the era of industrialization is a very special period in the history. Based on his keen observation of the trend of economic growth and wealth distribution in a long time span as well as his collection and analysis of long-term data, French economist Thomas Piketti concluded in his widely influential but controversial book entitled *Capital in the Twenty-first Century* that high-speed economic growth is a special phenomenon peculiar to the era of industrialization, or in other words, the very "normal" that sets apart the period of industrialization from other periods of time. Economic growth was extremely slow prior to the Industrial Revolution; high-speed growth will be forever gone once industrialization is completed. That is to say, slow or medium-slow growth will remain the long-term "normal" in global economic growth (relative to the period of industrialization). From 0 to 1700 A.D., the average annual growth rate of global output per capita was zero. But the fact that global output grew at an average annual rate of 0.1% is totally due to 0.1% population growth.

Since the Industrial Revolution, the situation of human development has significantly changed. From 1700 to 2012, the annual growth rate of global GDP per capita and the annual growth rate of global population were both 0.8%, so the annual growth rate of global GDP was 1.6%, 16 times as much as that prior to industrialization., especially between 1913 and 2012, the growth rate of world GDP was 3.0% per year on average, which can be broken down between 1.4% for world population and 1.6% for GDP per capita. Such phenomenon is very rare in the long history of human civilization spanning several thousand years (see Table 4.3). What is noteworthy is that the average annual growth rate of Asia's output per capita was 3.8% from 1990 to 2012 (see Table 4.4), a good testament to China's great contribution to the global economic growth.

Thomas Piketti believes that, viewed in the long run of human development, it would be unbearable and even hard to imagine if global population keeps growing

Table 4.3 World growth since the Industrial revolution (average annual growth rate)

Years	World output (%)	World population (%)	Per capita output (%)
0–1700	0.1	0.1	0.0
1700–2012	1.6	0.8	0.8
1700–1820	0.5	0.4	0.1
1820–1913	1.5	0.6	0.9
1913–2012	3.0	1.4	1.6

Source Thomas Piketti, *Capital in the Twenty-first Century* (trans. Arthur Goldhammer), Cambridge: The Belknap Press of Harvard University Press, 2014, p. 73. Table 2.1

Table 4.4 Per capita output growth since the Industrial Revolution (average annual growth rate)

Years	Per capita world output (%)	Europe (%)	America (%)	Africa (%)	Asia (%)
0–1700	0.0	0.0	0.0	0.0	0.0
1700–2012	0.8	1.0	1.1	0.5	0.7
1700–1820	0.1	0.1	0.4	0.0	0.0
1820–1913	0.9	1.0	1.5	0.4	0.2
1913–2012	1.6	1.9	1.5	1.1	2.0
1913–1950	0.9	0.9	1.4	0.9	0.2
1950–1970	2.8	3.8	1.9	2.1	3.5
1970–1990	1.3	1.9	1.6	0.3	2.1
1990–2012	2.1	1.9	1.5	1.4	3.8
1950–1980	2.5	3.4	2.0	1.8	3.2
1980–2012	1.7	1.8	1.3	0.8	3.1

Source Thomas Piketti, *Capital in the Twenty-first Century* (trans. Arthur Goldhammer), Cambridge: The Belknap Press of Harvard University Press, 2014, p. 94. Table 2.5

annually at the rate of 1% and global economy at a speed far higher than 1% for long. For example, "if the rate of population growth observed from 1700 to 2012—0.8% per year—were to continue for the next three centuries, the world's population would be on the order of 70 billion in 2300." Therefore, "an annual growth of 1% implies major social change". "The history of the past two centuries makes it highly unlikely that per capita output in the advanced countries will grow at a rate above 1.5% per year." "History shows that only countries that are catching up with more advanced economies—such as Europe during the three decades after World War II or China and other emerging countries today—can grow at such rates. For countries at the world technological frontier—and thus ultimately for the planet as a whole—there is ample reason to believe that the growth rate will not exceed 1–1.5% in the long run, no matter what economic policies are adopted." To sum up, since the completion of

the second industrial revolution, the output per head of developed economies would grow at an annual growth rate of 1–1.5%, i.e., a "new normal".[1]

Robert Gordon, a famous American economist, believed that the second Industrial Revolution had the deepest and the most far-reaching influence among the three ones. The high-speed growth of American economy fueled by the third Industrial Revolution has just lasted 8 years, whereas the great influence of the second Industrial Revolution on American economy has lasted as long as 81 years. Gordon is more prudent in predicting the future economic growth rate than Thomas Piketti.[2]

Based on his long-term research, Veteran Norwegian futurologist Jorgen Randers predicted that in the next 40 years, "we are also about to experience some waning of materialism as a driver in a materially rich society…The total result will be a continuing decline in productivity growth, which in turn will contribute to stagnation and then decline in world GDP." "The Chinese economy will grow fast throughout the next forty years and will be four times bigger in 2052 than in 2012. This means an average growth rate of some 3.5% per year."[3] Here, the so-called "fast growth" is just 3.5% annually, which is already a very optimistic "normal" of economic growth that can be foreseen.

In his book *Chinese Economic Performance in the Long Run: 960–2030 AD*, Angus Maddison, a well-known British economic historian, analyzes systematically the long-term trend of China's economic growth based on his study of the trend of global economic growth in the long run. According to his calculation, in 1820, China accounted for 36.6% of world population, and 32.9% of world GDP, and its GDP per capita relative to the world average was 90.0 (the world average is 100). In 1952, China's share of world GDP declined to 4.6%, and its ratio of GDP per capita to the world average was just 23.8%. In 1978 when China just began the reform and opening-up, its share of world GDP was 4.9%, and its ratio of GDP per capita to the world average had even declined to 22.1%. Since the reform and opening-up, China has begun to see a high-speed economic growth. By 2003, its share of world GDP had sharply increased to 15.1%, and its ratio of GDP per capita to the world average had risen to 73.7% (see Table 4.5).

Table 4.5 China's geopolitical standing, 1820–2003

	1820	1890	1913	1952	1978	2003
China's Share in world GDP (%)	32.9	13.2	8.8	4.6	4.9	15.1
China's Share in world population (%)	36.6	26.2	24.4	22.5	22.3	20.5
The ratio of China's GDP per capita to the world average (%)	90.0	50.3	41.7	23.8	22.1	73.7

Source Angus Maddison, *Chinese Economic Performance in the Long Run: 960–2030 AD*, p. 60

[1] Piketti (2014).

[2] cited from Zhang (2013).

[3] Randers (2012).

According to Maddison's analysis, "It is likely that the catch-up process will continue in the next quarter century, but it would be unrealistic to assume that the future growth trajectory will be as fast as in 1978–2003. In that period there were large, once-for-all, gains in efficiency of resource allocation in agriculture, an explosive expansion of foreign trade and accelerated absorption of foreign technology through large-scale foreign direct investment. The pace of Chinese progress will slacken as it gets nearer to the technological frontier. I have assumed that per capita income will grow at an average rate of 4.5% a year between 2003 and 2030, but that the rate of advance will taper off over the period. Specifically, I assume a rate of 5.6% a year to 2010, 4.6% between 2010 and 2020 and a little more than 3.6% a year from 2020 to 2030. By then, in our scenario, it will have reached the same per capita level as western Europe and Japan around 1990, when their catch-up process had ceased. As it approaches this level, technical advance will be costlier as imitation is replaced by innovation. However, by 2030 the technical frontier will have moved forward, so there will still be some scope for catch-up thereafter."

Having adopted different statistical methods and scales, these scholars got slightly different results on calculation and forecast of the long-term economic growth rate; however, they concluded with roughly the same historical trajectories and future trends of economic growth. As far as China's economy is concerned, its annual growth rate, which used to be around 10%, has currently declined to 8% and even below 7%. A study conducted by Chinese Academy of Social Sciences (CASS) shows that "structural slowdown has constituted a main feature of Chinese economy's new normal"; besides, it also predicts that "China's potential growth rate range between 2011 and 2015, between 2016 and 2020, and between 2021 and 2030 will be 7.8%–8.7%, 5.7%–6.6% and 5.4%–6.3% respectively".

All in all, whether seen from the long-term history of human development or judged by global economic trends in the past two or three decades (especially trends of China's economic development since the 2008 global financial crisis), a medium- to long-term historical stage characterized by a "new normal" in economic development is coming! The "new normal" will remain the basic nature and major feature of China's economic development for rather long. As a matter of fact, even though the growth rate declines to 7% or even below, it will still be a "high speed" or "medium-high speed" relative to the long-term "normal" of global economy and the situation of the rest of the world during the same period. Therefore, the so-called "new normal" also refers to a normal state of mind and a broad vision, or the general trend of economic growth based on rational predictions under "a normal state of mind" and from a long-term perspective.

Therefore, seen from the long history of China's rise and the law of "quality" being conditioned by "quantity", China's economy is currently at a critical turning point in the history, that is, China is "approaching, reaching and surpassing" the world average level. According to IMF statistics, GDP of the United States was, by purchasing power parity, 17.4 trillion dollars in 2014, whereas China's GDP totaled 17.6 trillion dollars. So, in this sense, China has already become the largest economy. According to the World Bank Report: *2011 International Comparison Program Summary Results Release,* China's economy was as large as 86.9% of US

economy in 2011, up from 43.1% in 2005. Besides, it also forecasts that the size of China's economy will increase by 24% between 2011 and 2014, but that of the United States will just increase by 7.6%. If such prediction comes true, China will overtake the United States and become the largest global economy by 2014. However, if measured by the real exchange rate, GDP of the United States will be 17.4 trillion dollars in 2014 and China's GDP 10.4 trillion dollars. In this sense, the gap between China and the United States is still very large.

According to the calculation by Angus Maddison, China accounted for 4.9% of world GDP in 1978 and its GDP per capita was just 22.1% of the world average. That is to say, China's output and income per head was just around one fifth of the world average over thirty years ago. However, owing to the reform and opening-up, China has witnessed a hyper economic growth since the end of 1970s, having grown rapidly from a weak and poor country into the world's second largest economy. Besides, nobody seems to doubt whether China will restore its position as the world's largest economy, and they all seem to believe that such restoration is just around the corner. As a matter of fact, China ought to be the world's largest economy since China is the most populous country in the world; in addition, its output per capita and income per head should at least reach the world average as well. But if it failed to have the world's largest output or demand, that would be sadly abnormal!

In this sense, China's over thirty years' hyper economic growth is just the result of "the law of averages" at work. It is actually a "catch-up" effort to reach the average, just a "one-time process" in the special stage. According to statistics, by the end of 2013, China's population totaled 1360.72 million (excluding HKSAR, MSAR and Taiwan), accounting for around 19% of world population. However, by using whatever calculation methods, China's share in world GDP is still significantly lower than China's share in world population. It means that China, if calculated by income and output per head, is still in the list of countries below the average level. If a comparison is drawn between countries, China just ranks No. 80–90 in the list of 200 countries/regions by GDP, that is to say, China's GDP per capita is still lower than that of most countries/regions, whether it has the largest or the second largest GDP.

Since the 21st century, China has seen a very rapid growth in GDP per capita, which, relative to the world average, has increased to 70.3% in 2014 from 17.5% in 2000. China is one of the fastest growing economies among major countries. During the same period of time, only Australia and Russia had higher relative development indices (RDI) than China [RDI here = the ratio of GDP per capita to the world average in 2014 (%)-the ratio of GDP per capita to the world average in 2000 (%)]. It is mainly because Australia and Russia are both resource-based economies that have benefited a lot from China's rapid industrial growth. This is a good example of China fuelling the growth of global economy. However, China is still under the world average level in terms of GDP per capita (see Table 4.6).

Viewed from a global perspective, China's rise and national renewal will not truly begin until China's GDP per capita reaches the world average level. And now it is the time! Angus Maddison predicted that China's share in world GDP would probably increase to 23% by 2030. That is to say, from now on till 2030, China's output and

Table 4.6 The List of GDP per Capita by countries (US dollars; of the world average %)

Countries	2000	2014	RDI
world	5453 (100%)	10804 (100%)	
China	955 (17.5%)	7594 (70.3%)	+52.8
India	457 (8.4%)	1631 (15.1%)	+6.7
Indonesia	790 (14.5%)	3515 (32.5%)	+18.0
Japan	37300 (684.1%)	36194 (335.0%)	−349.1
South Korea	11948 (219.1%)	27970 (258.9%)	+39.8
The United States	36450 (668.4%)	54630 (505.6%)	−162.8
Brazil	3766 (69.1%)	11613 (107.5%)	+38.4
France	22466 (412.0%)	42736 (395.6%)	−16.4
Germany	23685 (434.3%)	47627 (440.8%)	+6.5
Russia	1772 (32.5%)	12736 (117.9%)	+85.4
Turkey	4220 (77.4%)	10543 (97.6%)	+20.2
UK	26296 (482.2%)	45603 (422.1%)	−60.1
Australia	21667 (397.3%)	61887 (572.8%)	+175.5

Note RDI here = the ratio of GDP per capita to the world average in 2014 (%)-the ratio of GDP per capita to the world average in 2000 (%)
Sources "Appendix II: Main Social and Economic Indicators of Other Countries/regions, Appendix 2-5 GDP per Capita", *China Statistical Yearbook 2015*, National Bureau of Statistics

income per capita are expected to reach and surpass the world average level, and the "new normal" will display new distinctive features.

When China, a giant country, is well above the world average level in terms of GDP per capita, its economy and society will be much more complex, and the way it interacts with the world will also change completely. In the study of economics, "country" is often regarded as a unit of analysis. However, other countries cannot be mentioned in the same breath with China; the interregional economic relations of most countries cannot be with that of China, either. China's second-level division's GDP (such as provinces, autonomous regions and municipalities directly under the administration of Central Government) is already as big as that of some rather large countries, so it is natural that "developed economy", "developing economy" and "underdeveloped economy" co-exist in China, and such co-existence will continue for a long time even within some particular Chinese regions. More importantly, we need to know there are many deep reasons for regional economic diversity, just like each industrial country also has its unique features. For instance, Greece will never be the same as France or Germany, no matter how developed it will be. Likewise, different regions of China will inevitably develop more distinctive features when China is well "above the world average level", although before that point they tend to develop in similar ways under the "gradient development model".

4.3 Features of China's "New Normal" of Economic Development in the New Era

It is reported that the concept of "new normal" was firstly used by PIMCO president Mohamed El-Erian in 2008 to predict the long-term trend of global economic growth since the 2008 global financial crisis. Chinese president Xi Jinping firstly spoke of the "new normal" during his inspection tour in Henan province in May 2014, requiring government officials to "embrace the economic characteristics of the current stage, adjust to the new normal, and remain cool-minded strategically". On November 10th, 2104, President Xi Jinping delivered a keynote speech entitled "Seeking Sustained Development and Fulfilling Asia-Pacific Dream", expounding systematically the new normal of China's economy. President Xi said that the "new normal" displayed the following new features: first, the gear of growth is shifting from high speed to medium-to-high speed; second, the economic structure is being constantly improved and upgraded; third, the economy is increasingly driven by innovation rather than input and investment.

The new normal will bring many new opportunities for China's development: notwithstanding the economic slowdown, its economy still ranks among the first in the world, whether in growth rate or GDP; the economy tends to grow more steadily and the driving forces of growth will be more diversified; the economic structure is being improved and updated, and therefore the future growth will be more stable; the administration is streamlined and power is delegated to the lower levels, so the dynamism of market will be further unleashed. This is a description of what China's "New Normal" is and will be like at the current stage and in some future period, relative to the first 30 years of China's reform and opening-up. Actually, we can also study the economic trend since the beginning of China's late modern history in order to better understand the characteristics of Chinese economy's "New Normal" at the current stage.

China began its late modern history against the backdrop of industrialization. Over the past 100 years, China has also undergone many dramatic changes in the process of industrialization. These years can be roughly divided into four stages: the embryonic stage (1921–1949), the primary stage (1950s–1970s), the acceleration period (1980s–2012) and the deepening period (2013-the mid 21st century). Every historical stage, spanning around three decades (see Table 4.7), has already developed their typical features, i.e., their respective "normal".

The embryonic stage of China's industrialization can be dated back to 1912[4] and ended in 1949 when the People's Republic of China was founded. In this stage, the dominant social spirit was "to save the country by engaging in industry", and social values were changing from conservatism to materialism, that is to say, people had then begun to focus more on material achievements. Having awakened to China's poverty and backwardness, some Chinese people set western industrial powers as

[4]Its embryonic stage can also be dated back to the Self-strengthening Movement (initiated by comprador bureaucrats in the latter half of the 19th century in order to preserve the rule of the Qing government) or an earlier time, which will not be discussed in this book.

Table 4.7 A summary of economic features at each stage of China's late modern history

Periods	1912–1949	1950s–1970s	1980s–2012	2013-the mid 21st century	Mid 21st century-
Stages of industrialization	Embryonic stage	primary stage	Acceleration period	deepening period	Post-industrialization
Stage features	wartime turmoil: fumbling for the right path	Hard struggle: planned economy	Path to prosperity: the reform and opening-up	To build China into a strong and prosperous country: state governance	Global power
Social spirit	"to save the country by engaging in industry"	Poverty alleviation; thrift	"To let some people get rich first"	Be inclined towards "sharing"	Pluralism & inclusiveness
Value orientation	Transition to materialism	Naïve materialism	Ultra materialism	Moderate materialism	Post-materialism
Behavioral goals	Basic livelihood	Physical products	Income, wealth and GDP	Sustainable Development, environmental protection development	Life quality; self-fulfillment
Behavioral characteristics	Shift of essence from Chinese learning to western learning	Collectivism self-sacrifice	Cut-throat competition; focusing on scale and speed	value fairness and the concept of risk aversion	A balance between work and leisure; individual autonomy
Policy inclination	land ownership revolution; maintaining people's livelihood	"production first and life second"	"Efficiency first"; promotion of high GDP and high growth	Promote efficiency through fairness; rule of law	Respect the will of people; welfarism

(*Source* It is summed up by the author)

their role models with a view to saving their own country, which has thereby strongly inspired the whole society to greater efforts.

At that time, the whole society tended to believe that China must also develop science, technology and even democracy just like what western industrial powers did, since they were then ahead of China in these respects. It was then considered very fashionable to copy any of western practice. Because of extreme economic backwardness, China's first economic priority then was to maintain people's livelihood; and it would be a great blessing if no one died from hunger. So, what concerned people most at that time was land ownership revolution and the maintaining of people's livelihood. Against this backdrop, Yat-sen Sun, the founding father of the Republic of China (1912–1949), put forward the revolutionary idea of "equalization of land ownership", and the Chinese Communist Party proposed to "overthrow the local

despots and distribute land", which both proved that land, as "the mother of wealth", was then the top concern.

The early stage or initial stage of China's industrialization was generally believed to start from the founding of the People's Republic of China (PRC) in 1949 and end in the late 1970s. Since the founding of PRC, China had begun to develop planned economy in the hope of catching up with developed countries through strenuous efforts. The social spirit of the day was to get rid of poverty and backwardness and to value highly the virtue of thrift; and the social values were oriented towards "naive materialism", that is to say, the society just aimed for high output of physical products and the obtainment of basic means of production and subsistence, such as "taking steel as the key link" and "taking grain as the key link". The typical behavioral characteristics were collectivism and self-sacrifice, and the representative slogan of that time was what Jinxi Wang, dubbed as "Iron man" due to his devotion to work in Daqing oil field, ever said, "I would give up 20 years of life so China can produce oil on its own land." The policy inclination was then "production first and life second".

The period of acceleration started from the 1980s when China began to carry out the reform and opening-up and didn't end until the first decade of the 21st century, more specifically, the year of 2012. This is the era of reform and opening-up, when China determined to pursue socialist market economy and to fully integrate with global economy. The social spirit during this period was to "let some people and some regions get rich first", to put it simply, "to build up family wealth"; even communist party members were also encouraged to "take the lead in getting rich". The social values were then more typical of materialism, or "ultra materialism". In other words, income and wealth growth were valued so much that GDP race had almost become the goal of overriding importance as well as a "hard truth". The most typical economic behaviors were "cut-throat competition" and "just focusing on scale and speed" at a huge cost to resources and environment. The widely accepted guiding principle was then to "give priority to efficiency with due consideration to fairness".

The period of China's deepening of industrialization started from 2013 and will not end until the mid 21st century, when China strives to realize state governance modernization by deepening reforms comprehensively. This is the era of "New Normal" of economic development. The social spirit in this era will be more and more inclined towards "sharing". Material achievements are still important and the society should still "be devoted wholeheartedly to economic development", however, people have begun to pay more attention to fair distribution of benefits and pursuit of non-material things, even if it might slow down economic growth to a certain extent. Such social values can be called "moderate materialism": even though the era of materialism hasn't come to an end yet and it still remains the main object "to build China into a strong and prosperous country", values of post-materialism are already emerging. Therefore, social behaviors in this era will not only be driven by the desire to develop, but more by people's concerns about environmental quality and sustainable development. As a result, people will tend to value justice, fairness and the concept of risk aversion, and the guiding principles will inevitably change to "promoting efficiency through fairness" and the rule of law ensuring fairness.

It is predicted that China will enter the era of "post-industrialization" by the mid 21st century. By then, the social spirit will tend to be more diversified and inclusive, and social values more typical of post-industrialization. People's possessiveness of material things will decline relatively, and they will value more the quality of life and self-fulfillment. In terms of behavioral characteristics, the society will care more about a balance between work and leisure and individual autonomy. By that time, respect for the will of the people and welfarism will probably be the dominant guiding principles.

Judging from the brief summary of economic characteristics at each stage of China's late modern history, the new normal of economic development at the current stage has deep roots in history. The new normal, as the result of long-term accumulation, has now become a "Great Tendency" and a "Great Logic" in a "Great Era", heralding a turning point in history. It seems to have confirmed the old Chinese saying "Thirty years the east bank, thirty years the west bank", which means one's destiny will change over time. The next 30 years, a continuation of the past thirty, sixty or even hundreds of years, will definitely be a brand new 30 years!

China entered the new normal of economic development in the context of "new globalization". American economist Jeffrey Sachs said, "What is new is that a combination of breakthrough technologies and changes in geopolitics has created a far more intensive set of economic interconnections than ever before. The most important technologies of the new globalization are those of information, communication, and transportation. The new globalization is the globalization of the digital age." "Every generation faces novel challenges to combine efficiency, fairness, and sustainability. Two hundred years ago in Western Europe and the United States, the main challenge was to promote and humanize the first industrial revolution; 150 years ago, the main challenge was to create a safe and liveable urban environment as large industrial cities began to explode in population; 75 years ago, the main challenge was to surmount the Great Depression. Our main challenge is to harness the new globalization. We must find new ways to live efficiently, fairly, and sustainably in a very crowded and tightly interconnected world."[5]

In whatever new era, there are always new problems arising: once old problems are solved, new problems or challenges would follow at their heels. This forms an endless flow of history in human development, a unity of continuity and discontinuity: on the one hand, time and space are continuous, i.e., inheritable and related, which means "the normal" in each era is the continuation of the one in the last era rather than an absolute discontinuity. On the other hand, time and space are also discontinuous, i.e., varying from stage to stage, by which it means that "the normal" at each stage is notably different from the one in the previous stage, and therefore time and space at each stage take on a series of new features.

China's new normal of economic development is not groundless; rather, it is born out of the "womb" of the last 30 years' economic development, and thereby it still bears the mark of that era. Just like at any other stages, where new problems and challenges tended to arise after new achievements were made, China has to make new

[5] Sachs (2011).

moves at the stage of "new normal" to address such problems or challenges. And the focus of social attention will accordingly shift, too. In the book *Scarcity: Why Having Too Little Means So Much* co-written by American economist Sendhil Mullainathan and psychologist Eldar Shafir, they wrote, "Scarcity captures our attention, and this provides a narrow benefit: we do a better job of managing pressing needs. But more broadly, it costs us: we neglect other concerns, and we become less effective in the rest of life."[6]

Based on such logic, China began to pursue ultra materialism and became too obsessed with material achievements, especially GDP growth due to extreme scarcity (extreme poverty). It is totally understandable, because scarcity tends to make people overvalue the things they desire, and the marginal propensity to get scarce things tends to be high, that is to say, the society is highly sensitive to growth rate. But once great material achievements are made, GDP growth will not be the top concern any more. Not until then would people realize that, just as Sendhil Mullainathan and Eldar Shafir put it, they have neglected other concerns and become less effective in the rest of life after scarcity captured their attention. Therefore, to "change the development pattern" became a pressing task for China. To achieve that, we should be cool-headed and try to slow down rather than be too desperate for success, paying more attention to the issues which are becoming increasingly important, such as environmental quality, fairness in distribution of wealth, public services, and social fairness and justice.

Economics and psychological studies can both prove that scare things that people are desperate to get are always paid particular attention; however, once they are obtained in large quantities, they will not be that valued any more. Therefore, the whole society would eventually enter a "new normal". This can explain from another perspective why there is still so much discontent since China has made so many huge economic achievements in the past thirty years, and why China must embrace a new normal to achieve new goals.

4.4 The Impetus for Reform Under the "New Normal"

One of the features of the "New Normal" of economic development is an all-round push for further reform and a trade-off between short-, medium- and long-term goals. "To maintain steady growth" is a short-term goal, "to make structural adjustment" is a medium-term one, while "to promote reforms" is a goal to achieve in the long run. However, the long-term reform also needs a real source of power as well as incentive compatibility.

The past thirty years are the golden era of China's reform and opening-up. Slogans of the day, such as "development is of overriding importance", "time is money and efficiency is life", and "let some people and some regions get rich first", not only demonstrated the impetus for economic development in that era, but provided the

[6]Mullainathan and Shafir (2013).

source of power for reform and opening-up as well. "Whoever reforms first will benefit first" was then the incentive compatibility mechanism behind the reforms, as it could motivate reforms spontaneously and provide primary-level officials and people with great initiatives. Under such motivation mechanism, the reform and opening-up went in full swing and yielded substantial results within over thirty years, but in the meantime it also caused many problems. Any "impetus" tends to bring some "side effects" or "recoil", and any achievement has a price.

What has been pushing China's reform forward in the first thirty years since 1978 can be called the first-level impetus, which, however, also caused some "side-effects" in the meantime (see Table 4.8).

- The basic impetus for the reform of state-owned enterprises (SOEs) is profit orientation, marketization and the establishment of modern enterprise system, which have turned enterprises into an economic entity with their own interests and strong motives for profit maximization. But they will inevitably lead to some side effects, that is, some enterprises have to close down, suspend operations, merge with other enterprises or switch to other products; some workers are laid off; monopoly enterprises use their market domination to their advantage; and moreover, it is unclear as to what SOEs are and what roles SOEs are to play.
- The impetus for industrial reform is the differential and selective industrial policies. On the one hand, preferential treatment will be granted to enterprises that choose to reform as incentives for economic growth, and the strongly competitive industries will be given strong support, too; on the other, they also bring about "side effects", i.e., inadequacy of innovations and excess capacity. On the part of enterprises, since they can enjoy preferential policies, and an increase in output can immediately bring them profits, why should they bother to make technological innovation?
- The main impetus for land reform is differential rent, with which land owners can make a fortune or accelerate land development. "Zero premium" can even be offered to attract investment; while an exorbitant price can also be bid for the sake of profits. So, many problems hindering reforms and development would be automatically solved as long as land is fully exploited. But the "side effects" will be exorbitant land and house price as well as housing demolition and relocation compensation disorder: highly compensated relocated households get rich overnight, while households which are compensated with a meagre sum of money due to demolition are thrown into a helpless situation. Land for construction is massively developed but fails to be utilized effectively: on the one hand, quotas on development of land for construction are very limited, which seems to indicate that land is in short supply; on the other hand, massive enclosure of land and land hoarding render a lot of land and houses idle.
- The basic impetus for the fiscal and taxation reform and administrative charges system reform is stimulus to surplus revenues. Public finance is encouraged to "increase revenues and reduce expenditure", just like what enterprises do; if there is a surplus, governments can increase expenditure when necessary. As a result, local governments compete to pursue development-oriented finance and to levy

Table 4.8 The first-level impetus for China's reforms and the "side effects"

Reform areas	Impetus	Side-effects
SOEs	Profit-oriented, marketization, the establishment of modern enterprise system	Layoffs, reassignment, monopoly for private ends, ambiguous nature of SOEs
Industrial economy	Selective industrial policies, differential treatment, stimulating growth	Inadequacy in innovations; severe overcapacity
Land system	Differential rent, make a fortune by land, promotion and acceleration of development	Land price distortion, compensation disorder, exhaustion of land for construction
Taxation and administrative charges	Stimulus to surplus revenues; to spend when necessary; development-oriented finance; to levy both taxes and administrative charges	Weak public finance, enterprises' heavy financial burdens
Financial system	Banking business expansion and incentives for senior executives	Financial activity being detached from real economy, low capital efficiency, high capital cost
Regional economy	GDP race, investment competition, giving administrative support to local enterprises	Inadequate pubic services, local protectionism running wild
Relationship between government and enterprises	Enterprises are not run by governments any more; governments are just responsible for examination and approval of projects; pro-business government, active intervention	Unregulated power, corruption, distorted corporate behavior
Distribution of income	Some people get rich first, different income standards	Widening income gap, decline of public satisfaction
Resources and environment	"Let Water Flow Rapidly", letting development take priority over everything, the benefit of holding onto the price advantage	Resource constraint, resource curse, and environmental degradation

both taxes and administrative charges. But the "side effects" are weak public finance and heavy financial burdens on enterprises.

– The main impetus for financial reform is banking business expansion and incentives for senior executives. In the financial and economic system characterized by high monopoly, banks sit idle and enjoy super profits. The state-owned banks, which were just declared "technically insolvent" by experts, suddenly changed into

highly profitable world-class banks. The side effects are a self-reinforcing cycle of financial activity being detached from real economy, resulting in low capital efficiency and high capital cost.
– The major impetus for the regional economic reform is GDP race. Local governments all strive to attract investment, giving administrative support to local enterprises. The side effects are inadequate pubic services and local protectionism running wild.
– The major impetus for the reform of relationship between the government and enterprises is that, instead of running enterprises, the government is just responsible for examination and approval of projects, and that a pro-business government intervening actively in economic activity can bring short-term benefits. But it also led to some side effects at the same time, namely, unregulated power, corruption and distorted corporate behavior.
– The impetus for the reform of income distribution is the philosophy of "letting some people and some regions get rich first". Each field and industry has come up with different income standards, and each of them claims to be in the right; monopoly industries and competitive industries go their own ways. The "side effects" are the widening of income gap and the decline of public satisfaction with distribution.
– The major impetus for the reform of regulations on resources and environment is the so-called "Let Water Flow Rapidly" policy, the principle of letting development take priority over everything, and the benefit of holding on to the price advantage. The "side effects" are resource constraint, resource curse and environmental deterioration.

The abovementioned impetus for various reforms has one thing in common, that is, whoever carries out a reform can directly benefit from it. To put it another way, reformers tend to carry out the reform to their advantage. Even though a reform is compared to an activity of "crossing the river by feeling the stones", it is still a well-planned exploration heading in a positive direction rather than being just a random activity. This is very consistent with the mechanism of incentive compatibility, which explains why the reform can keep momentum.

But here comes the problem. Reform aims to improve systems, and the system falls into the category of "public goods". If the reform is carried out merely for the sake of "benefiting reformers", production of "pubic goods" will be nothing different from that of "private goods". These reforms do keep strong momentum, but they cannot provide "public goods" as they are supposed to. Moreover, it might lead to privatization of "public goods", which would give rise to various interests among different groups and thereby conflicts of interest. In reality, structural reform tends to satisfy some people's interests and thereby create vested interests; the reforms harming those who have vested interests might meet with resistance and thereby slow down.

The so-called impetus for reform is the motivation behind reforms and people's support for them. In the first thirty years of reform, the impetus was people's belief in "pauperism is not socialism"; and the motivation was people's desire to "get rid

of poverty" and "get rich first". Preferential policies and special policies in support of reform tended to be exclusive, that is to say, these policies might just work for some people and some regions, rather than other people and other regions. Reforms were then to a larger extent driven by the so-called "effective impulse" rather than "rational decision-making", which can be seen from the slogans of the time: "Don't Argue,"[7] "Making Bold Attempts to Break New Ground", "Daring to Try and Just Do It", "To Judge by Results", etc.

Such reform became a strong engine of China's economic development, having yielded many good results and remarkable success, which is there for all to see. On the other hand, it has led to imbalanced, uncoordinated and unsustainable development and contributed to formation of some powerful and stubborn interest groups. Moreover, it has also created many system loopholes, large room for rent-seeking, and in particular appalling corruption and some de facto "private domains". Therefore, a second-level impetus is needed in such era of "New Normal" of economic development. That is to say, we should deepen the reform comprehensively in a way that suits production of "public goods" better, which thereby requires a social impetus for building "public domains", i.e., a set of systems benefiting the public.

In such "general logic", a set of systems and mechanisms should be well adjusted to the new normal of economic development; the impetus for reform will be switched back to production of "public goods", with "private domains" being compressed and "public domains" being expanded and improved to the maximum. Aside from economic structural reform, the goal of deepening reform comprehensively is to achieve modernization of state governance system and governance capacity. The guiding principle will change from "giving priority to efficiency with due consideration to fairness" and "stimulating economic growth" into "promoting efficiency through fairness" and "ensuring fairness by the rule of law". A unified, open, fair, orderly market mechanism will replace the previous reform path characterized by selective breakthrough, preferential policies and GDP growth race. Therefore, the logic behind reform is shifting from "production of private goods" to "production of public goods", which constitutes the new change in the "normal" of reform.

In theory, the impetus for reform comes from "centralization", "consensus" or "interests", which roughly correspond to "top-level design", "public decision-making" and "primary-level initiative" respectively. Ideally, the reform gains impetus from all the three, which actually head in the same direction, i.e., reform dividend, so the three all end up giving a boost to the economy. To put it simple, if China needs a new driver of economic development to adapt to the new normal, it must come up with new driving forces for the reform as well. If fair competition is a more durable and effective driver of economic development under the New Normal, whatever will promote fair competition in market economy, ensure its key influence on resource allocation and better the role of government will be the very driving force of reform.

[7]Note: "Don't Argue (bu zheng lun) is what Deng Xiaoping said in his South China tour speech in January, 1992. He said, "It was my idea to discourage contention, so as to have more time for action. Once disputes begin, they complicate matters and waste a lot of time. As a result, nothing is accomplished. Don't argue; try bold experiments and blaze new trails. That's the way it was with rural reform, and that's the way it should be with urban reform."

Willingness to reform might come from the rule of law or the innovative spirit. The former is based on the logic of "reasonableness", that is to say, the motivation for reform is to establish a "reasonable" system, which requires "top-level design". Such logic usually leads to a "centralized reform". In contrast, the latter is based on a "balance between morality and benefit", that is to say, the motivation for reform is to establish a "beneficial" system that needs to be "welcomed by people". In this logic, "primary-level initiative reform" is preferred. Whether driven by the rule of law or the innovative spirit, reforms must be built on consensus, striving to be both "reasonable" and "beneficial". Therefore, in order to advance reform under the new normal of economic development, we not only need to act promptly and boldly, but behave prudently to weigh the pros and cons with careful planning and thorough arrangements.

First, in the new normal of economic development, the mechanism and balance of interests will undergo a series of systematic changes due to transformation of economic growth pattern and a decline in economic growth rate. Therefore, in order to advance the reform, there has to be a trade-off between "production orientation" and "distribution orientation" in the mechanism. In terms of policy-making, the government needs to be neither too "pro-business" nor too "pro-people", trying to strike a balance between the policy of "encouraging competition and rewarding the advanced" and that of "supporting the vulnerable and meeting their basic needs".

Second, since reform "dividend" is the source of power for reform, the success of reform will be directly seen from the number of persons who are made better off in proportion to those who are made worse off. Reform dividends shouldn't be abstract or invisible, but concrete and tangible instead; besides, benefits should be delivered promptly or at least without too much delay. In theory, only if social impetus is markedly stronger than social resistance, or more specifically, only if persons who are made better off overwhelmingly outnumber those who are made worse off, would it be possible for the reform to be carried forward. Even in a centralized reform claiming to be perfectly reasonable and legitimate, there will still be some people who are made worse off. So, dividends of such reform should be put into perspective. Although there is probably no room for "Pareto improvement", which means it is almost impossible to carry out a reform without making at least one person worse off, it is still necessary to follow the principle of "positive motivation", which means the reform will apparently create a lot more positive energy than negative energy it will inflict. This is also called "Kaldor-Hicks Improvement".

Third, the reform should tread cautiously while trying to deal with the vested interest structure caused by the first-level impetus for reform. The government should moderately recognize and preserve acceptable vested interests, reduce unacceptable vested interests resulting from obvious unfairness, and curb or even crack down heavily on illegal means of gaining profits. Anti-corruption campaign has won wide and strong support from the people, having unleashed very strong positive energy and broken through the barrier of vested interests to reforms. In order to win more popular support, the reform should try to make more people better off and let them feel the benefits directly and deeply.

Fourth, the reform should make governments, society, and market relations more and more adjusted to the new normal of economic development. Moreover, governments should change their mentality from "attending to people's needs as if they are their parents" into "serving people's needs as public servants" or "serving as an arbitrator". Since the impetus for the new normal of economic development is gained by unleashing the dynamism of market and society, the impetus for reform must also be built on the strong support from market micro-agents and members of society. However, there are some disturbing problems in the present: some fields and sectors have seen a greater administrative tendency and a "paternalistic" way of carrying out reforms. "Top-level design" and "normal behavior" have been distortedly interpreted as an administratively-run "implanting" of concepts and beliefs (termed "unified implementation" in policy language). Agents of market and members of society have thereby become passive recipients of reform, so the reform is reduced to a process of implementing the superior's orders. It is totally incompatible with the logic behind the reform under the new normal of economic development.

Fifth, the logic of "public goods" in the structural reform determines the necessity of neutral "think tanks" and a mechanism of "third-party evaluation". Concrete reform measures will inevitably affect some interests and usually bring them some harm. Even though these measures are reasonable in general, they will not necessarily benefit all equally; and moreover, they will probably harm some people's interests. In this sense, some "non-stakeholders" or "irrelevant parties" need participate in the process of decision-making, which is one of the features that set the second-level impetus apart from the first-level one.

Sixth, one distinctive feature of the "New Normal" of economic development is that monopolies, especially administrative monopoly, are to be gradually removed to ensure fair competition and the decisive role of market in resource allocation. In order to break monopoly, the reform must be strong enough to hold it back. Therefore, the "reform" here is more than an economic reform; the economic structural reform will not be a complete success unless reforms in all fields are to be deepened comprehensively. Besides, when it comes to major and complicated interests, the reform also needs a "political decision-making" mechanism.

4.5 The Relationship Between Fairness and Efficiency and the Driver of Innovations Under the "New Normal"

As mentioned above, in the past thirty years, China's economic development and reform mainly gained impetus from the policies of "getting rich first" and "whoever reforms first will benefit first"; and the motivation behind it was ultra materialism. In the initial period of reform when China had just abandoned planned economy, China adopted for the time being the policy of "giving priority to efficiency with due consideration to fairness" in order to eradicate the problems of low efficiency and absolute equalitarianism inherent in planned economy. Even though such policy

targeting at certain problems was historically reasonable and did liberate the productive forces and boost economy, we had to admit that it did have great limitations and drawbacks, too. It was then just a "second-best" choice, aiming to achieve quick results in particular historical conditions. When China just started the reform and opening-up, the author of this book wrote an article warning that such policy might lead to some bad consequences.[8]

When China's economy has entered another "new normal" today, the previous relationship between fairness and efficiency has turned out unable to keep up with the times. If China continues to develop economy and handle social relations that way, it will result in an imbalanced, uncoordinated, and unsustainable development as well as severe social problems. Such policy means a tacit approval of improving efficiency at the expense of fairness. Since efficiency is considered the top priority, fairness will always be the second thing to consider in practice. In view of this, the government would rather resort to discriminatory policies in order to get instant results. So, one is usually favored over another, artificial hierarchy is often created, and the imbalance widens a lot, too. For example, some market players are considered "dominant" ones, whereas some "backup players"; some are highly protected while some restricted; some are granted preferential treatment, but some not; some are "valued", while some "neglected".

Under such policy, all types of enterprises feel unfairly treated. For instance, SOEs complain that sometimes they can not compete the way non-SOEs do; non-SOEs complain that they cannot do certain business exclusive to SOEs; foreign companies complain that they are limited this or that way; big enterprises complain that they shoulder very heavy social burden but are under strict control; small ones complain that they cannot be treated equally in terms of land and funds.

Once market competition and resource contention can be won through unfair means, especially when such unfairness results from flawed systems or policies, enterprises would not be interested in technological innovation any more, but instead they would probably put more efforts into winning preferential policies and rent-seeking. Viewed in the long run, unfairness will definitely lead to inefficiency, because it will discourage more micro-economic agents from unleashing dynamism and misguide them. As a matter of fact, it will be also very difficult to "give due consideration to fairness" when fairness cannot be ensured in competitions. That explains why the sense of unfairness among people is getting stronger and stronger after China has made tremendous economic achievements.

As we can see, many cases of imbalanced, uncoordinated and unsustainable economic development are highly related to the policy of overstating the importance of efficiency. The so-called "efficiency" that people had been pursuing in the last three decades mainly refers to short-term benefit, large output, quick profit and high income. At that time, the whole society, too anxious for success, all strongly sought after large output. "The larger and quicker, the better" had by then become the guiding principle of each production unit as well as the yardstick for success. Even the government also set "efficiency" as the major goal, for instance, they sought a much

[8] Jin (1986).

larger GDP growth rate and larger-scale production of enterprises, granting large enterprises more preferential policies and cheap land. On the one hand, this has indeed given a boost to high economic growth; but on the other, it has also led to economic imbalance, excess production, more idle land, rapid environmental degradation and over-exploitation of resources. All in all, to seek "efficiency" through unfair means has led to partial understanding and even misunderstanding of it and thus very bad after-effects.

Aside from the economic sector, the policy of "giving priority to efficiency with due consideration to fairness" has also caused many problems for other sectors. Take education as an example: the educational authority was then very desperate to build world-class universities, believing "the larger the better", and thereby giving preferential treatment to a group of large universities that they believed to be "the best". As a consequence, more and more public funds just went to a few "best" universities, and elementary and secondary schools thereby devoted more time and energy to producing top students for these universities. Inevitably, local educational resources also began to favor "key schools", resulting in many unstoppable unhealthy phenomena, such as selection of schools based on money and social connections, a trend toward younger-age educational competition, and many students getting tired of study and feeling like a failure. Public education was thereby reduced to "failure education", because it produced only a few high-scoring students while most students failed (to be admitted to specially funded top-class universities). Such educational system has not only led to unfair distribution of public educational resources, but strangled youngsters' creativity and innovation; and moreover, no universities turned into world-class ones under such policy.

Take medical care as another example. The government also allocated most public medical resources to first-class hospitals, resulting in these hospitals extremely crowded but other hospitals having few patients. Moreover, public hospitals and private hospitals were treated even more differently. Some so-called "non-discriminatory" policies turned out to be very ridiculous, because it is just like having a "grown-up" compete with a "child". So, the reality is now that "seeing doctors are extremely expensive and hard" on the one hand, but on the other, a lot of medical resources lay idle. To sum up, under the slogan of "giving priority to efficiency with due consideration to fairness", governments at all levels tend to "support and favor the excellent" and pursue vanity projects, resulting in accumulated advantage, i.e., "Mathew Effect". It will discourage people from making down-to-earth innovations and improving efficiency in the long run; besides, it will not be of any help to ensuring fairness.

Therefore, China need gradually adapt major policies to the new era of deepening the reform comprehensively, striving to "promote efficiency through fairness". We can see an important statement concerning fairness in the *Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform* adopted at the Third Plenary Session of the 18th Central Committee (November 9th–12th, 2013). It says, "The state protects the property rights and legitimate interests of all economic sectors, ensures that they have equal access to the factors of production according to the law, participate in

market competition on an open, fair and just footing, and are accorded with equal protection and oversight according to the law."

As for governments, they needn't do anything more to ensure "survival of the fittest", which is inherent in the market mechanism; that is to say, instead of "supporting and favoring the excellent or the strong", governments should "support and help the weak" in order to narrow the wide gap between the strong and the weak. Only in this way will the strong meet their match in fair competitions, and will all enterprises, whether strong or weak, large or small, be strongly motivated to make innovations so that their competitiveness will be enhanced as a whole.

As for the relationship between fairness and efficiency, it is rather complicated. It might involve a certain degree of "trade-off" (as in the Okun's Law), especially in the short run, and therefore people tend to believe that it is hard to achieve both fairness and efficiency. However, in the long run, efficiency and fairness are not incompatible in nature. "Fairness" is where socialism and market economy meet: the former embraces fairness and justice, and the latter values fair competition. The nature of socialist market economy determines that a mechanism should be built to "promote efficiency through fairness and achieve fairness through efficiency". Therefore, in order to make up for market deficiencies (including the possibility of extreme polarization) or to regulate market order (to ensure fair competition and fair trade), governments must try to establish and develop a compatible and complementary relationship between efficiency and fairness rather than let it be or deliberately amplify the "trade-off" and conflict between them.

To sum up, a new normal for the relationship between fairness and efficiency is one of the things that matter most to the new normal of economic development, as well as the key to "shifting from factors- and investment-driven development to innovation-driven development". In the real economic world, technological innovation is diversified. In order to form a mechanism of innovation-driven development, all economic agents, regardless of size, should be motivated and given the opportunity to participate in technological innovation. And the most effective way to ensure such mechanism is fair competition. Under fair competition, all kinds of economic agents would be highly motivated to give full play to their strengths and concentrate on making innovations in their respective fields. As a result, technological innovation will be made one after another in each field, which will be a totally changed situation from the past when technological innovation and breakthroughs were just made in some particular fields as a consequence of the government's "support", "favoritism", and "selection" or selective industrial policies. It is quite similar with sports, because the most effective way to improve the level of sports is also to encourage the entire nation to participate in fair contests and competitions, and there are no better ways. All in all, innovation-driven development under the new normal means to break all access barriers to industries and crack down on monopolies, trying to get more economic agents involved in competitions and promote all-round technological innovation under the rules of fair competition.

4.6 Behavioral Characteristics and Rule Consciousness Under the "New Normal"

The new economic normal also refers to the new normal in economic behavior, rules and rule consciousness. It is new changes in behavioral patterns and rules of behavior in economic activity that bring economic development to a new normal. And such changes are always consistent with the changes of people's values and rule consciousness, i.e., major changes to the value order such as "which value is important" and "how should people behave accordingly". It can be observed and strongly felt that Chinese people's values and behavioral patterns have greatly changed since the reform and opening-up. The society has been markedly different from the one it used to be more than 30 years ago. Now, China is to enter another critical transitional period. In the new normal of economic development, the "new normal" in value order, behavioral characteristics, and rule consciousness will be increasingly observed and felt in Chinese society. As for the new normal in the economic field, it will be characterized by the following features:

First, the rule of law will be valued. As the decisive role of market is getting widely recognized and felt, the notion of "market economy being an economy under the rule of law" will also become increasingly popular in the society. Under the new normal of economic development, "the rule of man" will decline and legal awareness will be constantly enhanced, and thereby the rule of law will be the dominant feature of the new normal in concepts, behaviors and rules. It means the society will attach more importance to "procedural justice" and "process management" under the new normal of economic development; the government "should do nothing unless it is legally authorized", while citizens and enterprises can do "whatever is not prohibited by law". So, governments should neither over-exercise their power under the pretext of "doing good deeds" or "producing good results", nor find any excuses for their inaction when they are supposed to fulfill their duties prescribed by laws. In contrast, citizens and enterprises are allowed to do business and make innovations in whatever fields that are not prohibited by laws. So, under the new normal of economic development, microeconomic activity will be more dynamic under the rule of law.

Legal awareness will surely directly lead to the rise of civil rights awareness among the public. Civil rights such as human right, property right, the right to know, the right to express, the right to share, and the right to participation will become concrete realities rather than empty talk or abstract ideas. It means that the foundation of market economy has been solidified and the economy is being more and more governed by the rule of law. The ideal state of an economy under the rule of law is as follows: on the one hand, "the exercise of power must be confined within the institutional cage" and not allowed to be traded; on the other, "market must be put on the right track" and not derail. Only if power is not to be abused and market is not to overstep the boundaries, will market economy be able to bring into full play its role in allocating resources effectively and promoting constantly the economic and social development.

Second, the sense of transparency will be developed. "Weak explicitness" is a traditional feature of Chinese society. In other words, many "rules" are not written

explicitly on formal documents (such as legal documents), because "that which cannot be put into words can only be grasped through silence". The society is rife with "hidden rules" and high information asymmetry, which are both regarded as "normal". For example, unequal rights and non-transparency are quite commonplace in the process of administrative examination and approval related to economic activity; only personnel above a certain level can gain access to various "documents"; whoever reads the documents that they are not supposed to will be accused of "leaking documents". As for laws that are supposed to be known to all, there are also some classified documents, whose titles are printed in red, containing secret provisions.

However, under the new normal of economic development, the sense of transparency involved in economic activity, especially the relationship between government and enterprises will be greatly enhanced. The people will strongly ask for openness and transparency, which means government affairs, enterprise activity and work ethics will be required to see the light of day and their transparency needs to be improved. Besides, the development and application of modern information technology will give a boost to the economic activity and the improvement of government transparency. And the tradition of "weak explicitness" will change accordingly: unwritten and implicit rules will become increasingly explicit and finally end up being written into documents. Therefore, low trust would be replaced or compensated by high transparency so that the degree of self-discipline and civilization will increase with the improvement of transparency. Moreover, that "transparency is also a measurement of competitiveness" will become a new normal, too; "openness and transparency are to win the day, while cover-up is doomed to failure" will be a competition rule.

Third, the principle of non-discrimination will be followed. Under the new normal of economic development, a new, unified, open, competitive, and orderly market system will be established, which means some basic requirements should be met for such a market system, for example, it should assure market players equal rights and opportunities. Discrimination in any form will be considered a violation of the justice principle in market competition. Under the new normal of economic development, many phenomena such as household-registration-based discrimination, age and gender discrimination in employment, discrimination against public service workers, discrimination against those who have low business spending will be denounced by the public. Non-discrimination policies such as "fair examination" and "open competition for jobs" will become the major means to allocate human resources, while discriminatory hiring standards disguised as "recruitment based on competitive selection" and "consideration of occupational requirements" will be sidelined.

Fourth, the society will develop a new conception of "relations". Chinese people have been traditionally valuing interpersonal relationship. So, they tend to use personal connections before doing business, as they believe such ties will have a great bearing on the outcome. In other words, it is generally believed that "connections" will make a huge difference to business. Therefore, people tend to devote a lot of time, energy, human and financial resources to building or solidifying connections before economic transactions and thereby produce very large "transaction costs". Some economists straightly called it "connection tax" or "corruption tax", which is

a special tax people have to pay before doing business so as to solidify connections. But such phenomenon will change significantly under the new normal of economic development. In China, the conventional wisdom is that it is almost impossible not to rely on any "connections" while doing business. Those who don't know "you scratch my back, I'll scratch yours" in any relationship are considered "otherworldly"; those nicknamed as "non-stick pans" aren't expected to do something big; moreover, the rapid development of Internet has massively expanded the social network, "heavy reliance on connections" having becoming a ubiquitous phenomenon.

However, under the new normal of economic development, the malpractice of solidifying connections through corruption will be prohibited by laws. With the crack down on corruption, people will develop a new conception of "relations" and figure out new ways to interact with people so that "trading money for power" will be broken, communications facilitated, transaction costs of "solidifying" connections reduced, and thereby a new normal of "relationship marketing" established, too. Such phenomenon, which, though not explicitly spoken, did influence China's society deeply, will undergo far-reaching and profound changes under the new normal of economic development.

Fifth, China's economy will witness a trend of de-hierachialization. The huge but rather efficient administrative system has remained a great "Chinese characteristic" as well as one of the most outstanding "national conditions of China" for more than two thousand years. Administrative hierarchy still remains unchanged and administrative rank is still the "universal equivalent" to power and status despite the practice of market economy and wealth growth over the past three decades. Under the New Normal of economic development, justice and fairness will matter more, and market will play a more decisive role in resource allocation. By then, China's economy might see a trend of "de-hierachialization", even though hierarchism is hard to remove in the short term; that is because pan-hierarchism has already led to "hierarchical inflation", i.e., devaluation of administrative ranks. Especially by the time reforms are comprehensively deepened and "the exercise of power is indeed confined within the institutional cage", administrative-hierarchy-induced "illusion of power and profits" will be greatly weakened, thereby accelerating power purification as well as devaluation of administrative ranks. As a result, China will see a downward trend of administrative hierarchism undermining fairness in market competition, which might be another profound change brought by the new normal of economic development.

Sixth, an awareness of cost rationalization is to be developed. It can be expected that people's concept of cost/benefit will change significantly under the new normal of economic development. If we say that people, in the past three decades, could still do "whatever it takes" to achieve a particular end, but people will not afford to do so any more under the new normal of economic development. The society will have to weigh the pros and cons before making decisions, so will individuals. This constitutes a typical change in behavioral pattern and rule consciousness when the society switches from "ultra materialism" to "moderate materialism". That is to say, the society should not develop economy without considering environmental damage; pay and benefits must be on the table; land acquisition must be compensated properly; employees must have several days off for rest and relaxation; the quality

of life must be ensured, even for those who work round the clock; the society must ensure that people's basic living needs are met while practicing "the survival of the fittest" … To sum up, social behavioral patterns and codes of conduct will shift to cost/benefit balance and risk aversion. When there have to be costs, they must be paid; however, if the costs are unnecessary, they must be saved. The society will not rely too heavily on "mobilization" or "campaigns" to achieve quick results, but instead, it should count on a "reproducible", "promotable" and "sustainable" regular system. Great ambitions and a normal state of mind are both needed. Any policies or measures must be based on a rational analysis of costs and benefits so as to avoid any major "subversive mistakes". This will be another distinctive feature of "strategic thinking" in economic development under the New Normal.

4.7 Shifting from "Anxious for Quick Success" to "Strategic Thinking" Under the "New Normal"

The economic normal is not only an objective trend, but a kind of strategic thinking and mentality, i.e., a subjective judgment on whether the economic situation is normal and proper. China had remained a rather weak and stagnant economy prior to the founding of PRC, despite the fact that capitalist industrialization was already beginning to take shape. Not until the PRC was founded did China begin to catch up with the developed countries. Since the reform and opening-up, it became even more committed to economic development and wealth accumulation, more and more people trying to join the ranks of "getting rich first" and each industry/region being desperate for world-class achievements. On the one hand, China did achieve high economic growth; but on the other, an unhealthy social psychology was also created, that is, people were all too anxious for quick success, scrambling for things and losing patience. Pursuit of short-term achievements became a very typical feature of that historical period. However, under the new normal of economic development, the social psychology will shift to a normal state of mind, strategic mindset, long-term rationality, public thinking and enduring patience. This era might not produce incredible achievements or immediate results, but it will ensure long-term prosperity and stability, enabling China to achieve sustainable development and realize the dream of national renewal step by step.

– Long-term rationality, as opposed to "short-term mentality" seeking quick returns and instant benefits, refers to far-sightedness and broader horizon while observing, judging and evaluating. All evaluations, even including evaluation of human achievements, can only stand within a certain time limit. So, a recent high evaluation does not necessarily mean its value will remain high for long; and moreover, a "valuable asset" might become a "liability" in the future. On the contrary, quiet and small efforts will probably bring long-term benefits in the interest of future generations. Strategic mindset determines strategic horizon at critical junctures. In the previous three decades, China was so poor and backward that it could hardly

gain any footing in the global arena, so it had to go all out to seek quick returns and instant benefits; however, once China is rich and developed enough to consider long-term benefits under the New Normal, it could settle down to the great renewal of the Chinese nation. Take "Belt and Road" initiative as an example: instead of being a short-term goal, it is a centurial strategy guided by long-term rationality, aiming to achieve national renewal.

– Public thinking means to overcome the narrow mindsets of achieving small gains without considering the overall situation and seeking to make private gains without any concern for others. The reform is supposed to be a public cause for the whole society, aiming to create public goods. However, if the reform is driven by partial interests rather than guided by public thinking, it will probably be reduced to sheer pursuit of profits and even rent-seeking: "If the reform benefits me, I will do it; otherwise, I will resist it"; "it's my right to pursue profits, and so is monopoly." Some ideologies and vested interests as a barrier to reforms lack public thinking, turning "public goods" into "private goods" and taking "public systems" as their "personal possessions". In essence, the right reform cannot possibly be the result of "economic man". According to American moral and political philosopher John Rawls, a just system is a social construct under a "veil of ignorance", that is to say, only when people are unware of their own private interests can they establish social systems in line with the spirit of justice, which does seem too idealistic and thereby rather implausible. However, at least top-level decision-making should be based on public thinking, because it is a very necessary condition for social fairness and justice, especially social system reforms and the establishment of systems and mechanisms representing the spirit of fairness and justice.

In contrast, an "economic man" society driven by sheer self-interests rather than public interests can hardly ensure effective reforms even in logic. Just as American psychoanalyst Erich Fromm said in his book *To Have or To Be* published in 1976, "For the first time in history, the physical survival of the human race depends on a radical change of the human heart. However, a change of the human heart is possible only to the extent that drastic economic and social changes occur that give the human heart the chance for change and the courage and the vision to achieve it."[9] Here, the so-called change of "heart" refers to a switch from consideration of sheer self-interests to consideration of public interests. All in all, in order to deepen the reform comprehensively under the New Normal of economic development, social consciousness and human wisdom transcending self-interests, such as public thinking, overall consideration, social rationality, will be increasingly important.

– Enduring patience means to overcome shallowness, impetuosity, the mentality of "focusing on scale and speed", and other perceptions that "it is better to plant grown-up trees moved from elsewhere than transplant seedlings" and "it is better to borrow talent from elsewhere than teach them from ABC". It should be acknowledged that although we can quicken the pace of development or moderately shorten the time, some important stages can never be skipped; some achievements can be

[9]Erich (2013).

made by taking short cuts, but there are also some achievements that cannot be achieved in a rush, but instead, we need take our time to do it slowly and fine. Over the past three decades, China had been busy with catching up and relying mainly on imitative innovations, thereby increasing the probability of "slow fish being eaten by quick fish" and people tending to "seize every minute". However, under the New Normal, economic growth will be more driven by all-round original innovations, and thereby persistence, endurance and relentless efforts will be needed more than ever.

The biggest obstacles to China's economic innovations are not lack of resources or technological sources, but lack of enduring patience, obsession with quick returns and instant benefits, fickleness, and even the mentality of taking pride in opportunism and copying. China had ever naively believed that it was "on the same startling line" with developed countries, which were actually many decades or even a hundred year ahead of China in economic development; China had ever mistaken innovations for something with huge explosive power, something that will work miracles and then bring good results overnight; China had wishfully thought that through "capital operation" would China definitely enter the global top 500 list, and that if a company was not big enough, it could be merged with others to form a big one, because quantity and scale matter; and moreover, those who have achieved quick success were mostly revered. These mentalities are the biggest enemy to technological innovation.

If China wants an innovation-driven economy, it must be patient and tenacious. An old Chinese saying goes: "Distance tests a horse's strength and time reveals a person's heart", it reveals the very basic logic behind original technological innovation. Not every innovation will be a success, and failure is also a "normal" of innovation. Without start-up or innovation failures, the success of innovations would not be that impressive. If the government believes that by granting preferential policies or treatment to its so-called "potential" winners will they definitely stand out and succeed very soon, it will be a great harm to the environment of mass innovation. As a matter of fact, innovation is considered something very common in innovative countries. In these countries, the government seldom grants preferential policies or judges subjectively, but a succession of innovations keeps emerging anyway; besides, these countries all prove to have great tenacity and patience for innovations, and they usually do not expect quick results too anxiously. Since our society calls for mass entrepreneurship and innovation and regards them "an economic normal", innovations should not be considered something uncommon or big any more.

Research shows that major technological innovations in human history are not inventions of geniuses at "eureka" moments, but an inevitable result of the evolution of the "scientific and technological being". The continuity of technological progress is far stronger than its discontinuity, and its inheritance its revolutionary nature, too. Just like the evolution of organism, technological revolutions are actually the stage where technological progress and major breakthroughs begin to emerge as a result of long-term technological accumulation. Technological innovation and innovative ideas/methods are continuous and long-lasting rather than sudden or occasional occurrence. Therefore, in some sense, a normal state of mind ensures endurance in

the process of innovation and thereby maintains the social environment of mass innovation, which should be another basis for national innovation policies. Instead of granting preferential treatment to the chosen ones, the government should try to make non-discriminatory policies to ensure fair competition; instead of pursuing "quick innovations", the government should strive to create a healthy environment for original innovation. To interfere with fair competition is nothing different from encouraging opportunism, sapping patience and misguiding innovations. Innovative countries need enduring patience and long-term commitment of the whole nation, which is a very penetrating issue as to whether the country's economy can be driven by innovations under the New Normal.

TO SUM UP, after over three decades' high-speed growth, economic expansion and GDP race, China has overcome severe material scarcity and sluggish economy and thereby made remarkable economic achievements; but at the same time, it also led to imbalanced, uncoordinated and unsustainable development. It is against such a backdrop that China's economy entered a "new normal", a new stage of economic development mainly characterized by mid to high-speed growth, structural adjustment, innovation-driven development, quality improvement and fair sharing. Therefore, we need be more patient, persistent and committed than ever in order to realize the great renewal of the Chinese nation. Under the New Normal, China's national development strategy should be more indicative of "strategic thinking", that is to say, China should develop a long-term perspective, set up goals with long-term impact and try to maintain prolonged stability.

References

Erich, F. (2013). *To have or to be* (p. 8). London: Bloomsbury Academic.

Gu, Q. J., Zhang, Z. F., & Wang, X. Q. (2014, November 10). "*Xi Jinping Firstly Expounding Systematically* '*the new normal*'", Xinhua net.

Jin, B. (1986). To promote efficiency through fairness & to achieve fairness through efficiency. *Economic Research Journal*, *7*.

Li, Y., & Zhang, X. J. *On the "New Normal"*, CASS Academic division of Economics research report series, No. 2014-004.

Maddison, A. *Chinese Economic Performance in the Long Run: 960–2030 AD,* second edition, p. 20.

Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why having too little means so much* (p. 14). New York: Times Books.

Piketti, T. (2014). *Capital in the twenty-first century* (A. Goldhammer, Trans.) (p. 83, 95, 572), Cambridge: The Belknap Press of Harvard University Press.

Randers, J. (2012). *2052: A global forecast for the next forty years* (p. 162, 275). Chelsea Green Publishing.

Sachs, J. D. (2011). *The price of civilization: Reawakening American virtue and prosperity* (pp. 85–86). New York: Random House.

Zhang, Y. Q. (2013, November 20). Lackluster scientific innovations prohibiting the economic growth of the United States in the long run. *CCIEE Information Feedback*, *17*.

Chapter 5
Path to Innovation: Technological Progress and Structural Upgrading

How China's economic growth is related to innovation is just a matter of perspective. But it is generally believed that China's industrialization was more driven by resources and capital input than original technological innovation, so, China should make its economy more innovation-driven so as to achieve sustainable growth. The Chinese government also supports this idea. But some specialists, research institutes, especially some foreign researchers argue that China, whose economy is actually very innovative, has just chosen a unique path to innovation. It is a paradox that on the one hand China is recognized to have made huge economic progress, but on the other it is considered not innovative. Without innovations, how can China's economy grow so fast? Even if innovation is just narrowly defined as "the use of new technologies", China's industrialization is still no less innovative than any other developing countries, not to mention under Joseph Schumpeter's broad definition[1]! So, whether China's economy is innovative is first and foremost determined by the definition of innovation. But this chapter will neither discuss any theoretical debate on this matter nor judge whether China's industrialization is innovative; rather, it will mainly focus on China's path of technological progress in the course of industrialization.

[1] Joseph Schumpeter believes that innovation means to establish "a new production function", i.e., a new combination of factors of production; that is to say, it means to combine factors of production with production conditions in a totally new way and then introduce it into the system of production. "Innovation" is the engine of capitalist economic growth and development. Without innovations, capitalist economy would not have made so huge development. Innovation is the commercial or industrial application of something new—a new product, process, or method of production; a new market or source of supply; a new form of commercial, business or financial organizations.

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5.1 Sources of Industrial Technology

Industrial technology is essentially the method and procedure of changing the physical form of matter through mining, processing and manufacturing, turning the useless into the useful. Industrialization is a great process of the human race's making technological advances and promoting material production. Technological progress is the material basis of industrialization, and China's remarkable achievements in industrialization are actually a reflection of its technological progress. As China is a developing country, where industrialization started two hundred years later than the western Industrial Revolution, it will inevitably copy and transfer technologies from developed countries. It is true that China did not copy technologies entirely from western countries and did make some technological breakthroughs, but judged from the general path of industrial technology, its technological advances still belong to diffusion of industrial technology from western countries.

Since the founding of PRC, China had three major sources of industrial technology: First, in the 1950s, China gained some technologies in basic industry, especially heavy-chemical industry under the economic aid from the Soviet Union. Second, China had to develop on their own some technologies in key industries, especially industries vital to national security and defense, which could not be transferred from foreign countries, such as nuclear industry, shipbuilding industry (submarine etc.) and aerospace industry. Third, since China's rapprochement with the west in the 1970s, especially the reform and opening-up, China massively introduced foreign technologies and drawn a lot of foreign investment, and thereby gained various medium-low processing and manufacturing technologies.

It can be seen that China's technological advances were generally based on technologies diffused from developed countries, and thereby still belong to "imitative innovation". As for the second type, China did make great breakthroughs in these fields on their own, but it was just reinventing the wheel after being denied access to these technologies from developed countries. Since China did this in response to the ban on transfer or trade of these technologies, let's call it "ban-induced" imitative innovation or "trade-prohibition-induced" imitative innovation. As for the first and third types of technological progress, let's call them "aid-induced" imitative innovation and "trade-induced" imitative innovation respectively.

With the constant deepening of China's industrialization and its industrial technology approaching increasingly the level of developed countries, imitative technological innovation will inevitably be on the wane while original technological innovation will play an increasingly important role. Unlike the 1970s, few technologies are now banned from being transferred or traded due to hostile relations; rather, commercial competition is the major reason for bans on transfer or trade of some technologies. These "banned" technologies or technologies "prohibited from trading", which are now increasingly and urgently needed for China's industrial development, cannot be offered or traded in regular ways; but instead, they can only be obtained by making indigenous innovations.

On the other hand, China is now becoming a world leader in some industrial technologies, and even developed countries are also trying to catch up. These technologies might be "tradable" and even can be gained through global competitions; but they can not be offered freely any more. So, let's call it "trophy" technologies, because who will have a cutting edge or who will be the winner is decided by the outcome of global competitions in industrial technologies. As a result, how to gain the impetus for technological innovation and how to enhance its innovation capability has become an increasingly important strategic issue for China in the process of industrialization.

Therefore, China proposed in the very beginning of the 21st century the target of becoming an innovative country; while entering the second decade of the 21st century, China re-emphasized it by proposing to shift from a resource-based and investment-driven economy to an innovation-driven one. In other words, indigenous innovations will gradually replace "imitative innovations" and become a major contributing factor to China's technological progress in the process of industrialization.

On May 19th, 2016, the State Council of the People's Republic of China released *The Outline of the National Strategy of Innovation-driven Development,* putting forward three major steps to promote the country's innovation-driven development. Step 1, China should become an innovative country by 2020; step 2, China should rank among the first innovative countries in the world by 2030; step 3, China should build itself into a strong technological innovation power and the scientific and innovation center of the world by 2050.

The basic physical technological features of China's industrialization are reflected in the evolution of its industrial technological progress or innovation path. Industrialization is a process in which material wealth is constantly being created and amassed in large quantity and industry keeps making advances due to scientific discoveries and inventions. Thanks to these discoveries and inventions, not only tools and means of industrial production are constantly being upgraded, but the scope of industrial development also keeps expanding. When existing tools and means of industrial production are widely used and there is almost no room for growth in demand of industrial products, in other words, when current technologies of industrial sectors are already very mature and growth momentum is declining, a new technological revolution will be needed. Therefore, revolutionary technological progress must be made to promote the upgrading of industrial structure and industrial system, and thus to massively expand industrial space.

As for other countries, there are also two major types of industrial technological progress in the process of industrialization. One is indigenous technological innovation, which means technological progress is mostly made by the country on its own and therefore it has independent intellectual property rights on many technologies especially core technologies. The other is diffusion of technology, which means a country usually makes technological progress by imitating or learning other countries' existing technologies; besides, these technologies can also be purchased. In this case, the country usually has very few independent intellectual property rights and does not have access to core technologies, either; but it can still achieve industrial growth by receiving other countries' industrial technologies.

As a matter of fact, the so-called "some country's technology" is a very loose term. Science and technology, with its own laws of development as well as a unique way of making progress, should be independent of national boundaries. It can even be said that "science and technology know no borders", because knowledge has no borders and ideas know no boundaries. In this sense, classification of industrial technologies based on nationality is actually a very shallow understanding, i.e., a very loose interpretation of extremely complex reality. In the process of industrialization, no country can rely exclusively on indigenous technologies without receiving any technologies diffused from other countries. China makes no exception, as it is also part of the world economy and the whole mankind's industrialization.

The main carrier of industrial technology is real industry, which usually has its own nationality in modern times, so enterprises as a main component of industry, also have their own "nationalities". If there are any enterprises without nationalities, they are not the mainstream at all. We can see here that industrial technological progress is closely related to the industry's global strategy and any changes to that. In the process of China's industrialization, industrial relocation gives a huge boost to technological progress. So far, the primary source of China's most industries and technologies is still western developed countries (and the former Soviet Union in the 1950s). In this sense, China mainly obtained industrial technologies through diffusion of technology from western developed countries. That is to say, relocation of western modern industries and diffusion of western industrial technologies form a major part of China's industrial development and technological progress at the present stage. However, Chinese enterprises are not just passive receivers of western technologies or industries; rather, they also make technological innovation, i.e., re-innovation based on their digestion and absorption of western technologies. Receiving industries relocated from western countries and absorbing their technologies are indeed China's basic ways to make advances in industrial technology.

Industrial relocation targeted at developing countries including China is more than the spatial shift of industries. It involves the "slicing-up" and re-organization of supply chain. That is to say, enterprises from developed countries usually slice up the production chain and allocate some components production to developing countries (through direct investment, outsourcing, facility supply, trade of technology, etc.) in order to achieve a new international division of labor and re-allocation of resources. On the other hand, components production can also integrate into the production chain of target developing countries and realize the re-organization of production chain, thereby improving efficiency, reducing cost, expanding production and market space. Therefore, when China begins to speed up industrialization by receiving industries relocated from developed countries, it will also get more and more deeply involved in global division of labor and thereby contribute a lot to world industrial development.

The role that a country plays in the global division of labor defines the basic features of its technological progress path and technical route selection. At present, though China has a very large economy in total, it still belongs to a middle-income developing country by income per capita. With global industrial competition and global division of labor being two underlying features of the time, China's income

per capita and factor endowment determine that China still has an edge in mid- and low-end products and the middle and low end of production chain in the industry of processing and manufacturing, which is reflected not only in low-cost advantage but the potential of technology acquisition. During the past two or three decades, many Chinese manufacturing industries were almost invincible in the global market competition on mid- and low-end products; and in the following period, China's market share in industrial products and equipment manufacturing will still keep the momentum of growth.

However, China will not remain the manufacturer of low-end and low-value-added products for long, because its income level has dramatically improved and the global landscape is also changing significantly in terms of factor endowment. As a matter of fact, many Chinese enterprises amidst global competition have sensed more and more deeply that market saturation and profit dilution have become an unstoppable trend with the transfer of traditional industries and technologies to China. In order to remain competitive and keep the momentum of growth, enterprises have to make new technological innovations; that is to say, they should strive for indigenous technological innovation, especially development of independent intellectual property rights and even core technologies. Various industries (be it mature industry or emerging industry) all face the urgent task of speeding up technology upgrading. Original technological innovation will have to contribute more and be the constant driver of China's industrialization. Recent years have seen more and more Chinese industries moving higher and higher up the value chain and turning into high-tech industries especially in more developed eastern coastal cities. China's technological innovation is gaining momentum, which can be seen from the increasing number of Chinese patent applications. According to some analysis, China has already vaulted into the ranks of great patent power (see Table 5.1).

5.2 Status and Trends of High-Tech Industries

Since the 1980s, China has seen a rapid growth in processing and assembly industry. Advances in industrial technology are seen first from massive shift and diffusion of processing and manufacturing technology from developed countries to China, contributing to the rapid improvement of China's production capacity and dramatic growth in production. Having entered the 21st century, China's equipment manufacturing industry is also beginning to pick up. Equipment industry is usually compared to the "machine tool" of the whole industry, the very foundation for a country's modernization as well as a major indicator of the country's economic strength. China has begun to massively revitalize the equipment manufacturing industry by undertaking more major projects and employing more indigenous technologies. China is already a world leader in some industries highly related to China's special national conditions, such as high-speed railway, ultra-high-voltage long-distance electricity transmission.

Table 5.1 The number of Chinese and overseas patent applications (three types) (1985–2014)

		Inventions	Utility patents	Design patents	In total
In total	1985–2009	586643	1368634	1127257	3082534
	2010	135110	344472	335243	814825
	2011	172113	408110	380290	960513
	2012	217105	571175	466858	1255138
	2013	207688	692845	412467	1313000
	2014	233228	707883	361576	1302687
Chinese patent applications	1985–2009	256367	1357209	1030276	2643852
	2010	79767	342256	318597	740620
	2011	112347	405086	366428	883861
	2012	143847	566750	452629	1163226
	2013	143535	686208	398670	1228413
	2014	162680	699971	346751	1209402
Overseas patent applications	1985–2009	330276	11425	96981	438682
	2010	55343	2216	16646	74205
	2011	59766	3024	13862	76652
	2012	73258	4425	14229	91912
	2013	64153	6637	13797	84587
	2014	70548	7912	14825	93285

Source State Intellectual Property Office of PRC (SIPO), record number: 2015 No. 83

An online newspaper article (*South China Morning Post,* December 8th, 2015) cited some statistics from the *Asian Economic Integration Report 2015* issued by Asian Development Bank: from 2000 to 2014, China's share in Asian export of high-tech products (such as medical appliance, airplane and telecommunication equipment) has grown from 9.4 to 43.7%, whereas Japan's share has fallen from 25.5 to 7.7% in the same period. In the meantime, China's proportion of low-tech products in total Chinese exports has fallen from 41 to 28%, which has to some extent indicated the significant improvement of China's industrial technology.

It is true that technological innovations and high-tech industrial growth might be somewhat different in a statistical sense, because high-tech industrial products include both high-tech and common components. But suffice it to say that China has seen rapid industrial growth and advancement in the process of industrialization, which has already proved China's remarkable achievements in industrial technology innovation, in the broadest sense of the word. However, we have to admit that, in a strict or narrower sense, China did not make too many original technological innovations over the past several decades. In view of this, China must strive to make more indigenous technological innovations, but it can hardly achieve within a very short period of time; rather, China must take a lot of patience and make strenuous efforts before it is hopefully achieved several decades later.

In the process of industrialization, efforts to shift from a low-end value chain to a high-end one are not only determined by the need of industrial development and market expansion, but by the interest structure of world economic order. In the current world economy, high-tech industries' advantage of high added-value keeps strengthening. Scale competition and profit dilution among conventional technologies and industries tend to cause a reduction in added value and profit rate, while high-tech industries tend to maintain high growth and high added value (and monopoly profits) over a long period of time. In other words, high-tech industries will promise much bigger economic benefits. Conventional industries' logic is that "it is true both you and I can do it, but I have lower cost than you, so I can lower prices to get more market share"; in contrast, high-tech industries' logic is that "I can do it but you can't, so I can keep making profits with prices and added value still remaining high".

With the intensification of global industrial competition in the 21st century, the focus of competition has gradually shifted from price and output to technology and innovation. That is to say, price used to be the decisive factor in market competition and expansion of output the major feature of economic growth; but since the world's entry into the 21st century, technology and innovation have gradually become the key measurement of an industry's competitiveness. In the past several decades, China's industrial development and market expansion was mainly achieved through its low-cost/price advantage and extensive economic growth mode. Entering the second decade of the 21st century, China became the world's second largest economy, just next to the United States, but many new problems also arose in the meantime. China has thereby come to realize that it would hardly make any new progress if it got stuck in such phase; and moreover, it might impede industrial upgrading, severely harming the national economy and thereby causing the "middle-income trap".

As major modern industrial technologies all come from western developed countries, technologies and technical routes of most industries will inevitably bear the imprint of the society where they were born. For example, when labor price is relatively high, the developed countries tends to save more on labor and less on capital to develop industrial technology, which explains why labor tends to be replaced by capital in developed countries. But in labor-abundant China, labor has to contribute more to industrial production than capital, without affecting the economic efficiency in the meantime. Therefore, capital tends to give way to labor in China. Besides, improvement of labor quality does not happen overnight, so high-tech industries have to adjust to the real situation of labor quality before replacing traditional industrial technologies.

Therefore, for a rather long period of time, China's industrial system will inevitably consist of industrial technologies at all levels, such as advanced technologies from western developed countries, necessary traditional technologies required by China's current economic and resource conditions, and high technologies reflecting the direction of new industrial revolutions. Accordingly, China's industrial products must be multi-level, too. For example, luxury cars costing hundreds of thousands or even millions of Yuan and mid-priced cars costing one to two or three hundred thousand Yuan are both needed in the auto market. In the meantime, there is also a huge market for economic cars costing only tens of thousands of Yuan and even forty

to fifty thousand Yuan. Besides, new energy vehicles also have huge potentials in the auto market, too. All in all, China's industry will surely be diversified and multi-level (i.e., involving multi-level technologies and producing multi-level products); besides, its quality will be improved in an all-round way.

So, high-tech industries face both challenges and opportunities under such economic and social conditions. On the one hand, the current situation tends to tilt the balance of resources in favor of conventional industries owing to their comparative advantages; that is to say, investments in conventional industries seem to be more lucrative in the short run. But on the other, some advantages are also transferrable, that is to say, China's high-tech industries can also gain such advantage from conventional ones in the course of development. Many high-tech industries started out as processing, manufacturing, and assembly industries, so in these activities, high-tech industries tend to have the same comparative advantages as conventional ones. For example, China's computer industry started out by manufacturing low-tech peripheral components, switching later to assembly and then to manufacturing of high-tech components; in the meantime, its major products have also shifted from desk computers to laptops.

At the current stage of industrialization, China needs to develop high-tech industries to expand industrial space and optimize industrial structure. Even if China's level of industrial technology is in general not too high, the slicing-up of high-tech supply chain and re-organization has enabled China to massively develop high-tech industries. On the other hand, China must try to combine high technologies with conventional industries to improve the latter's competitiveness, making high technology the main engine of their development. More importantly, China's industrial production capacity will increase in line with the level of science and technology, which will create a more favorable environment for high-tech industries to start and grow. After several decades' industrialization, China has grown into a strong manufacturing power, thereby ensuring the proximity of R&D centers to manufacturing factories, which is very favorable to China's becoming a real innovative country as well as a power with an edge in high-tech industries.

Aside from common problems faced by most countries in the process of industrialization, China still has a string of new and prominent problems to be solved, which will pose many new challenges for high-tech industries, but on the other hand, China will thereby have a larger demand for high-tech industries as well. For instance, China's huge population and economic density determine that China should not follow the western developed countries' old path of industrialization, which has proved to be extremely damaging to the environment, because the environmentally unfriendly activity of 1.3 billion people would be more than the already highly-polluted planet can bear! If a country's technology is at a very low level, it usually can not achieve lower level of pollution and lower cost or price at the same time. In the short run, Chinese industrial products will lose their edge if the bar for environmental protection is set too high. In the long run, it will be unsustainable to achieve lower cost and price at the great expense of environment, for environmental damage will be too dear a price and the country will end up going nowhere. As a result, it

will be more necessary and urgent for China to make technological advances and innovations, and accordingly high-tech industries will be in great and urgent demand as well.

Due to its special national conditions, China has provided many favorable conditions for high-tech industries, too. For example, China's market is huge enough to digest high investment in high-tech industries. As we all know, research, development and commercialization of high-tech products need huge investment, but only if such huge investment is paid off, a benign cycle of investment in high-tech industries will be formed and their economic rationality ensured, too. So, a huge market is the key to the problem, and China has a very obvious edge in this. For most Chinese high-tech industries, it is the market mechanism at work in resource allocation. China, with huge market potentials, tends to attract huge investment, so investment in R&D of high-tech products targeted at China's market will probably be very lucrative. So, China can attract huge investment not only for expansion of manufacturing capacity but for R&D of high-tech products.

Scientific progress brings high-tech inventions and improvements. Under market economy, commercialization of high technology is mainly realized through enterprises. Generally speaking, commercially funded high-tech industries can enhance their products' competitiveness and ensure a benign cycle from R&D to commercialization. High-tech enterprises, large, medium-sized or small, all have their own strengths. Only by encouraging all enterprises of different sizes to conduct the high-tech R&D and application that suits them the best in different parts of the value chain, will China achieve the maximum market efficiency of high-tech industries, including correct project selection and the achievement of economic goals.

In view of its huge industrial manufacturing system, China develops high-tech industries, not only just for the sake of developing high-tech industries, but for the purpose of improving the technological level of other industries and thereby enhancing the overall quality and global competitiveness of China's industry. Therefore, to ensure an orderly market competition necessary for enterprises' technological advance, especially high-tech development and investment, and to motivate them to develop and use high technology will be more effective than the government's own arrangements on high-tech project selection. It is actually very necessary for a country to attach importance to the development of high technology, but it does not mean that the country should directly invest in it or decide on which high-tech projects to choose. Rather, enterprises should make decisions by themselves on the basis of market situation and be ready to take risks, which is the right way to ensure a higher rate of success in project selection. There are many cases of China's success in developing high-tech industries, but it has also made some mistakes and ever paid a huge price. For example, photovoltaic industry, which should have been a promising high-tech industry, has now ended up with severe overcapacity and financial problems due to the government's direct intervention by granting "preferential" policies and financial aid.

As China's industry is diversified and multi-level (i.e., involving multi-level technologies and producing multi-level products), its high-tech industries also vary in development path. Some high-tech industries are an inevitable result of industrial

development, while some are the result of conscious efforts to open up a new field. In the former case, some Chinese high-tech industries emerged as a result of industrial development, especially after Chinese enterprises began to receive advanced technologies transferred and diffused from western countries. Generally speaking, the development path of such high-tech industries is determined by "economic efficiency"; while in the latter case, pioneering technology is the main driver of these high-tech industries, that is to say, China invests heavily in research and development of some disruptive, promising technologies and then promotes them in the market to achieve large-scale development and economic efficiency. Some economic conditions have to be met before any efforts are made to develop and commercialize some high-tech projects, and not the other way around; however, as for some other high-tech projects, concentrated efforts must be consciously made to pave the way for development and commercialization of these projects, otherwise the opportunity will be lost.

To sum up, R&D and application of most high technologies, especially development of high-tech industries (such as electronics and telecommunications industry) in China are the inevitable results of industrial development, and any conscious intervention in such natural course will lead to serious miscalculations and thereby huge economic loss. However, as for some industries (such as aerospace industry), concentrated efforts have to be made consciously to pave the way for their development. It is owing to its unique political and economic system that China is capable of "concentrating resources to accomplish such large undertakings". To put it simple, industrial development naturally brings about technological advances in the first case, while in the other one, original technologies promote industrial development; two development paths, namely, letting nature take its course and making conscious efforts to open up new grounds, are both of great significance for China's high-tech industrial development.

Aside from selection of development path, China's development of high-tech industries is also influenced by the decision-making system. Selection of high-tech projects should be mainly based on the outcome of competitions, not just on whether it is considered "important" or not or how "important" government leaders believe it is. As for some high-tech industries, their decision-making procedure is usually like this: first, a project is considered important and then attracts attention; next, the government decides on it; at last, the state invests in it. Being influenced by such mentality and the way scientific resources are allocated, some high-tech industries failed to straighten out the roles of government, specialists and market in the decision-making process. Generally speaking, when it comes to a few major projects, the government should have the final say on which one to choose; when it comes to frontier projects, professional opinions from specialists are crucially needed; while as for most projects that can be commercialized, market should play a decisive role. So, no one is superior to another; rather, they just focus on different types of projects. In general, market selection can best ensure economic efficiency, experts' choices can reflect the trend of scientific development, and government selection usually occurs when the projects are not meant to achieve economic ends (usually for political ends).

Many types of funds and issues of resource allocation will be involved in R&D of high technology and the decision-making by high-tech industries. Government fund and other non-commercial fund are mainly used for scientific studies and research of frontier technology, but the government's investment and participation in project selection should not affect fair competition. Commercial fund provided by enterprises should become the major source of investment for high-tech industries, and such fund usually yields higher efficiency and competitiveness. It is a fundamental path for both conventional and high technologies to seek development through competitions. Therefore, one important policy for the development of high technology is to ensure fair competition in the application of high technology and the development of high-tech industries, which is the basic direction for China's high-tech-industry-related structural reform. Surely, we cannot deny that some special industries and projects, especially strategic high-tech industries concerning national security, do need the state's direct involvement in decision-making, but at the same time, scientific decision-making procedures and institutions must be established as well in order to avoid wrong or improper decisions, misallocation of resources and corruption.

In the context of global division of labor and resource allocation, any country is sure to have their own preferences in high-tech research and development. Generally speaking, in order to survive and further develop, high-tech industries must meet two basic conditions, namely, advanced technology and economic efficiency. Without advanced technology, they would have no future, and the same is true when the industry has no economic efficiency. In the frontier field of high technology research, foresightedness, especially advanced technologies are most valued. But for high technologies to be commercialized, feasibility, especially economic efficiency is most valued. As mentioned previously, government, specialists and enterprises focus on different types of high-tech projects to serve different ends, so it is very natural that these projects differ in preference: the frontier research field values foresightedness and advanced technology, while commercialized high-technologies emphasize feasibility and economic efficiency. This is a very realistic problem that China must pay attention to while developing high-tech industries.

5.3 Technological Progress Under the Opening-Up Policy

A salient feature of China's technological progress is its opening up to the outside world. Foreign-invested enterprises played a very important role in promoting such progress, but at the same time also arose some problems that deserved people's attention. Prior to the 1970s, China had been practicing closed-door policies, but since the 1980s, China has opened up wider and wider to the outside world. During this decade, China has undergone a very unprecedented and significant change, including an intense and complicated political reform. Towards the end of 1970s, China established the policy of opening-up and has been adhering to it since then. China's policy of opening up is very radical compared with other countries on a par with China's economic development. Owing to its highly open industrialization policies,

global division of labor, which used to be achieved through international trade (i.e., international exchange of goods), has now been more influenced by international investment (i.e., global flow of capital), and the economic nature of comparative advantage has thereby changed significantly.

China has since fully participated in the global division of labor and attracted large-scale foreign investment, which is essentially a "yes" to international capital and transnational corporations, an invitation for them to "purchase" on a large scale cheap resources such as labor and land from China, to enjoy directly China's large resource endowment and to launch a "world war" in China's market. With huge market potentials and business opportunities, China has become a "battlefield" that all transnational corporations cannot afford not to enter. In some sense, it can even be said that corporations which have never "entered a war" in Chinese market cannot be called world-class ones at all. After a great number of foreign enterprises entered China's market, competitions among Chinese and foreign enterprises became very intense and complicated, consisting of three types of rivalry, namely, Chinese enterprises VS Chinese enterprises, Chinese enterprises VS foreign corporations, and foreign enterprises VS foreign enterprises. This constitutes a unique competition pattern in China's manufacturing market. Chinese leaders intended to quickly obtain advanced technologies by opening its market to the outside world, which is called "market-for-technology". But it still remained controversial as to whether the end has been achieved or not.

After their entry into China's market, transnational corporations can usually enjoy preferential treatment, the so-called "super-national treatment", which has thereby facilitated their access to China's market resources and greatly enhanced their own competitiveness. There are even cases of some foreign enterprises on the verge of collapse getting back on their feet again after they penetrated China's market. Therefore, China's policy of fully opening up the market especially investment and sales market to the outside world has, in this sense, "nurtured" trans-national corporations all over the world and turned them into super economic entities, which have thereby grown even faster, stronger, and more competitive in the global arena.

In the meantime, Chinese enterprises have also grown up in the fierce competition. They have been striving to improve its position in the global industrial value chain and to achieve industrial upgrading through international cooperation and competition. China has seen the emergence of a group of domestic enterprises with fairly advanced technologies and strong national brands, and some of them have already successfully penetrated global market. Under such global economic conditions, China's deep involvement in global competition and cooperation has become one of its important means to obtain major industrial technologies and make technological innovation. Chinese enterprises' strategic cooperation with foreign counterparts and their integration into the global network of transnational production and management have accelerated the spread of advanced technologies in China as well as its industrial technological advances. This will probably enable China to complete industrialization within just several decades, while it took western developed countries several hundred years to complete the same task.

While China tried to promote technological progress through international channels, especially through Sino-foreign joint ventures, it needed to make a rational choice between conventional technology and high technology, between conventional industries and high-tech industries. One of the most important goals for industrialization is to enhance the global competitiveness of industries and enterprises. So, what technology and what path of technological innovation can best enhance such competitiveness? In most circumstances, global competition participants (enterprises) should have the say. With the deepening of labor division within modern industries, each industry has been increasingly compartmentalized. Even "conventional industries" also have high-tech sectors and sub-industries involving high technologies; high-tech industry usually has a good many general-technology sectors and sub-industries involving general technologies (for example, high-tech computer industry includes manufacturing of computer case, keyboard, mouse and many "sub-industries"). Therefore, it will be hard to define the boundaries of conventional industry or high-tech industry in the real economic world, and any components production in each industry and sub-industries are all likely to make technological innovation. High compartmentalization and deep division of labor within each industry has prepared the ground for transnational production and management in terms of technology, and therefore Chinese enterprises, once part of the global network of transnational production and management, will have great potentials for technological innovation. As a result, they will definitely find the feasible path to technological innovation: import of technology from developed countries, learning from them, purchase of technology, and creating technology with independent intellectual property rights.

Generally speaking, a country should open up market to both domestic and foreign enterprises and give them the same national treatment in conformity with WTO rules, which however does not mean that the government of a nation-state does not or can not have any interests in domestic or foreign enterprises. No country will pay more attention to foreign enterprises than to domestic ones; in other words, a government disregarding domestic enterprises' development and interests does not exist at all (because a government is supposed to stand for the interests of their own people). Concern for technological progress and innovation of domestic enterprises and support for their research and development is one of the most important economic functions of government.

Even though the government must ensure fair competition among all enterprises in principle, it does not mean that the government must pay as much attention to technological developments of foreign enterprises as to those of domestic ones. Fundamentally speaking, the government is responsible for technological progress and innovation of domestic enterprises, and these enterprises' technological progress in general will also reflect to a large extent how successful the government's economic policies are. In an open economy, the government should watch the developments of domestic enterprises, including their technological progress, but it must avoid participating directly in or making R&D arrangements for these enterprises. Besides, it should not grant industrial policies in favor of domestic enterprises unfairly; otherwise, it will disrupt the order of fair market competition. And moreover, it might do

harm to domestic enterprises, too. They will be thereby less motivated or pressured to make indigenous innovation, and turned into free-riders and "consumers" of technology rather than innovators. Eventually, they would end up being lame ducks and no match for foreign corporations in technological innovation at all.

To sum up, it is a very tough strategic issue as to how to support Chinese enterprises' technological progress and innovation in the process of industrialization. In order to promote technological progress and innovation of Chinese industries and enhance their global competitiveness especially in technology, the government should, on the one hand, carry forward the policy of opening-up to boost such progress; but on the other, it should also try to avoid or stop unfair competition so as not to interfere with technological progress of domestic industries.

With the dramatic rise in the general level of China's industrial technology, independent intellectual property is also becoming increasingly important. Imitation or no technology control, which though might bring short-term economic benefits, will in the long run cripple the ability to innovate. It is particularly true that major strategic industries and core technologies can hardly be relocated or transferred directly from developed countries. Therefore, we must be determined to rely on our own efforts, going all out to invest more in R&D of these technologies and optimize its resource allocation in an effort to gain the technological high ground. China has thereby formulated many plans on economic, industrial and scientific development in the process of industrialization. In 2014, China unveiled a national plan called *"Made in China 2025"*, striving to become the leader among the world's manufacturing powers by the mid of 21st century after following the "Three Steps" within three decades.

China's huge market space and its opening up to the outside world had made it easier for Chinese enterprises to penetrate global market. They tended to invest money in expansion of production and gain larger market share so as to get short-term economic benefits. For rather long, China's industry had been growing in a horizontal way, i.e., on the same technological level, and just focusing on how to expand the industry of mid- and low-end technologies to the utmost. However, when it comes to major technological innovation projects, i.e., the high ground on industrial technology, enterprises would become very cautious and try to avoid them by taking low-standard alternative "shortcuts", the so-called "knockoff products". Especially when some industries grew very rapidly and their products were in great demand, these enterprises were too desperate for expansion of production so that they cared less about technological innovation. And moreover, they usually used low-tech and low-cost production facilities and methods of production (which often results in environmental pollution and too much consumption of resources) to increase output and occupy market so as to gain maximum short-term economic benefits.

Competitions just occurred among enterprises selling same products or providing same service and they all tended to use low-price strategies while striving to expand production capacity and occupy domestic and international markets. Lacking a sense of market segmentation and being extremely fond of technological imitation, they tended to lower their prices as much as possible to win competitions against other enterprises of the same kind but hardly challenge themselves by going beyond to

make any breakthroughs. As a result, technological innovation was just confined to very narrow fields. Though fierce competitions can bring about some technological progress, identical technical routes and lack of innovation motivation will undercut all domestic competitors (i.e., enterprises); and moreover, they often led to other countries launching anti-dumping investigation against Chinese enterprises in international trade. Chinese enterprises usually ended up losing the battle and being forced to withdraw from global market.

In order to attract foreign investment and advanced technologies, China has established several special economic zones and various high-tech industrial development zones all over the country after it opened up to the outside world. Local governments competed with one another to make preferential policies to attract investment for projects, such as allowing enterprises to retain more profits, giving them subsidies, and providing resources especially land at low prices. But as innovation projects heavily relied on investment, enterprises tended to devote more time and energy to seeking investment and "preferential treatment" than making innovation. Sometimes, they might even "raise" money from capital and credit markets, believing that it would be a "great success" to get investment or credit funds. We can often see the scene of people rejoicing at the company's shares getting listed in domestic or foreign Stock Exchange or being excited about being granted loans. "To make technological innovation" was usually the very version told to investors or credit agencies to cover up their real intention of getting listed on Stock Exchange (share capital increase) or getting loans. Gradually, investors and credit agencies would lose faith and confidence in enterprises claiming to make technological innovation, which will thereby create an unhealthy environment for the financing of technological innovation. But those enterprises with real intentions of making technological innovation usually ended up getting no financial support in times of need. Statistically speaking, China does have an exorbitant savings rate (indicating an abundance of investment), its money supply does grow very fast, and it does attract a lot of foreign investment, but it is still hard for enterprises to get financial support for technological innovation.

The abovementioned phenomena and problems are mostly chronical ones with deep roots. Rome wasn't built in a day, so these problems should be gradually resolved under joint efforts of enterprise, society and government. With constant improvement of China's system of socialist market economy and the level of economic development, Chinese enterprises' technological innovation is moving onto a much healthier track, which therefore holds great promise for future solution of these problems. Especially since the reform and opening-up, the technological level and innovation capability of Chinese industry has been significantly improved, enterprises have become dominant players in market competition, and the dynamic mechanism of technological innovation is also being gradually formed. Generally speaking, China has a very promising future in technological innovation: the gap between Chinese industry's technological level and the advanced international standard is closing; China is shifting from a resource-based and investment-driven economy to an innovation-driven one.

5.4 The Role of SOEs in Industrial Technology Innovation

A distinguished feature of China's economy is that state-owned enterprises (SOEs) constitute the bulk of economy. As to whether SOEs, different from other enterprises, contribute to China's technological innovation and its transition to an innovation-driven economy, it still remains very controversial.

We cannot just talk about the relationship between SOEs and technological innovation in the abstract; but instead, it should be analyzed in real specific conditions. In reality, enterprises are highly diversified. As we all know, enterprises can be roughly divided into state-owned enterprises and private enterprises, or other different types, but no enterprise in real conditions fits exactly into any of these categories. All classifications tend to be somewhat subjective.

Take SOEs as an example. The total number or defined structure of SOEs tends to differ when people use different statistical calibers and methods. According to existing statistical data, China has 155,000 SOEs. But how do people get this number, by counting legal entities or consolidated financial statements? How to define state-owned enterprise in a statistical sense? For instance, what percentage of state-owned shares is the threshold for being a state-owned enterprise? If a SOE gets listed on Stock Exchange, will it still be a "state-owned enterprise" or "state-holding enterprise"? Do the so-called state-owned shares include the portion held by legal entities? How to define an enterprise whose shares are relatively but not absolutely controlled by the government? Will the "actual controller" matter in such circumstance? Therefore, in view of the complexity of state-owned enterprises in China, we cannot make blanket judgments about SOEs.

On the other hand, technological innovation also varies from enterprise to enterprise. In the current stage of China's economic development and under the basic national conditions, Chinese industries and enterprises still have huge potential for technological innovation in a full range of fields and industrial activities, but they all have their unique ways to achieve that. Some of them are "continuous innovations", while some are "disruptive innovations". Moreover, the boundaries between "innovation", "imitation" and "learning" are quite blurred. Different industries and enterprises tend to take different paths to technological innovation due to different stages, market positions, challenges and opportunities.

To understand the complexity of enterprises and diversity of technological innovation is of critical importance to the study of the relationship between SOEs and technological innovation. Each enterprise is fit for a particular technological innovation or some particular ones; and in the meantime, diversified, all-round industrial technology innovation also needs a great variety of enterprises. Here, I just want to focus on technological innovation of typical SOEs. "Typical SOEs" refer to for-profit organizations established and funded by the state to achieve certain major purposes, whose scope of business and management are both designated by the state, whose behavior and activity is also governed by special laws and regulations (or policies) aside from common ones. As a matter of fact, what has attracted special attention of

the state and society is the relationship between this type of SOEs and technological innovation.

Many people believe that SOEs have some deficiencies unfavorable for technological innovation. They are as follows: First, state-owned enterprises lack dynamism of innovation. SOEs are funded by the state and do not have entrepreneurs whose position is filled in by the government, but innovation is a major function of entrepreneurs. But as for private enterprises, which are opened and run by entrepreneurs, they would not be called enterprises in the first place if they cannot make innovation. In this sense, SOEs are inherently less motivated to make innovation than private enterprises. Second, SOEs, undertaking special responsibilities and obligations and being designated for management of certain business, tend to be monopolistic. Since they can benefit from monopoly, why will they bother to innovate? Third, senior executives are in charge of decision-making in SOEs, and the state reviews the performance of these executives. SOE Executives tend to avert risks, as the state is more sensitive to "failure" than "success" in SOE management, believing that "merits can never wipe out faults" and that "it is not worthwhile to sacrifice taxpayers' money for an uncertain future".

So, does it mean that SOEs have no edge in technological innovation? Not necessarily so. In theory, all enterprises have both strengths and weaknesses, and no enterprise system is perfect: all enterprise systems are in some sense reasonable, but in the meantime they also have limitations. As a matter of fact, SOEs do have advantages in technological innovation, which at least includes the following aspects: First, SOEs are usually better at concentrating resources than private enterprises, and thereby have more favorable financing conditions. For example, banks usually are more reassured to grant loans to SOEs, especially in difficult times. Second, SOEs are endorsed by the state, so the odds of their bankruptcy are very small despite the limited liability system at work. If they run into big troubles, they tend to have more chances of being saved from bankruptcy than private enterprises. Third, there are usually special channels between SOEs and the government, and thereby SOEs tend to be more likely to get licensed. To sum up, SOEs do have some advantages over other types of enterprises, which also explain why almost all countries have state-owned enterprises.

Just as abovementioned, technological innovation in reality is diversified and involves many fields and industrial activities. Different technological innovations are fit for different types of enterprises. For example, technological innovation consists of two types: technological innovation with clear technical routes and technological innovation with high uncertainty. The success of the first type of innovation is mainly determined by input intensity, including fund and human resources. High-speed rail, big plane and aerospace, having very clear technical routes, fall into this category. Aside from their special capability to concentrate resources, SOEs also have an advantage in talent and organization. Therefore, they can give full play to their strengths, concentrating resources to make new innovations of this type. Instead of being rare occurrence, such type of innovation is very common in China's history of industrial achievements.

As the second type of innovation usually involves great risks and uncertainty, enterprises' investment decisions or technical routes in this regard tend to have lower probability of success. If SOEs undertake such type of innovation, it will be hard for the state to evaluate the performance of their senior executives. Therefore, such innovation will not be SOEs' forte. As a matter of fact, large private enterprises also have less advantages in this type of innovation; but small and medium-sized enterprises do outperform others in high-risk investment. In the United States and European countries, this type of technological innovation is often initiated by small and medium-sized enterprises, and then big enterprises pour in; or in other cases, small enterprises succeed making such type of innovation and grow into big ones.

To sum up, we should take China's actual national conditions into consideration and put SOEs' strengths and weaknesses into perspective. Each type of enterprise has their own use. Both state-owned enterprises and private enterprises have their own niches in technological innovation, with their strengths complementing with each other.

SOEs don't make technological innovation just for commercial purposes, but also for public benefits. They not only function as for-profit organizations but play the special role of fulfilling the national will as well. It is their duty to help the nation fulfill its mission; their technological innovation represents the nation's general intention on scientific and technological innovation. Therefore, SOEs should empower its own industry, other industries and even the whole country with much stronger innovation capability and thereby promote their achievements in this regard.

For example, all technological innovations involve many basic, common technologies, but China is rather weak in this respect. Basic, common technology is to a considerable extent a public good, whose progress has a direct bearing on other technological innovations, and thereby determines the whole country's level of industrial technology and the outlook for technological innovation. SOEs have a sharp edge in this regard. Besides, they are also more capable of making continuous technological innovation, including technique innovation. As private enterprises emerged in China only two to three decades ago, research and development of most technologies is still rather immature. In comparison with them, SOEs have a longer history, greater technological strength, better experimental facilitates and more devotedness. Therefore, SOEs have more favorable, realistic conditions for continuous technological innovation. On selection of technical route, such type of innovation tends to involve fewer risks (uncertainty) and thereby belongs to the first type mentioned above. SOEs have potential in this regard.

Due to special national conditions, many economic phenomena and challenges are quite peculiar to China. Therefore, it must make technological innovation to solve these special problems, and such task is usually undertaken by SOEs. For example, China's extremely large population and the imbalance in regional economic development resulted in the seasonal imbalance of traffic (such as spring festival travel rush) and thereby posed many new challenges for transport facilities. This is a strategic issue that the state must attend to. The construction of high-speed rail is a very typical example of SOEs undertaking such type of innovation.

To sum up, Chinese SOEs' technological innovation is both something of public value and a great mission of the nation, which is not only determined by SOEs' peculiarities but by China's special national conditions. In some countries, some technological innovation can be accomplished by private enterprises, while in China they have to be undertaken by SOEs due to lack of qualified private enterprises. Besides, the current economic system is still not perfect enough to make sure that resources will be allocated to private enterprises in time. As for some major technologies vital to national interest (such as national-security-related technologies), often part of technology race between countries, SOEs must take the lead to make great breakthroughs and blaze a new trail just like what they previously did to nuclear and aerospace industries.

Chinese SOEs, as a special and important type of enterprise, undertake innovations in major technologies and thereby could play a very special role in technological innovation in the process of industrialization. However, SOEs should also respect fair competition and conform to the general rules while making technological innovation. After all, fair competition is the most effective mechanism to ensure and promote technological innovation.

SOEs are somewhat monopolistic, and therefore all of them, except those reflecting national interests in global competitions, need to carry out a reform to reduce monopoly and stimulate technological innovation. In particular, China should rely less on administrative allocation of scientific and technological resources but more on fair competition to motivate SOEs to make constant technological innovation.

To judge the contribution of SOEs, one cannot just see how far they have gone in technological advances; rather, their influence on the whole industry and even the whole country should also be taken into consideration. On the one hand, technological innovation is the very mission that SOEs must undertake; on the other, SOEs must also try to prevent any "crowding-out effect" on other enterprises. The major goal for SOEs to make technological innovation is not to "defeat their rivals", but to build a solid foundation for the country and the whole industry to make constant technological innovations. Therefore, in order to ensure fair competition, a magnanimous gesture is needed from SOEs; especially when they are already near-monopolies in some fields, they should consider the overall situation and take initiatives to reduce their dominance in a socially responsible manner.

Besides, SOEs should also be well prepared for global competitions. Competition rules for international trade and investment are now changing so significantly that they might even transcend WTO rules. This will bring about a series of new challenges for SOEs which are to enter international competitions especially high-tech ones in the era of economic globalization. Therefore, SOEs must adapt to fair global competition rules, such as the principle of "competitive neutrality", to realize the strategic goal on technological innovation.

5.5 Establishment of a Modern Industrial System Amid Constant Innovation

The nature of industry determines that it has always been capable of promoting revolutionary transformations spontaneously, that is to say, abrupt changes often take place after a period of continuous development in the process of evolution. Technical nature and features of the whole industry as well as industrial structure changed dramatically as a result of new scientific discoveries and technological inventions, which is called "industrial revolution". Traditional industrial technologies tend to be gradually replaced by new ones after they reach the peak, thereby creating the new impetus for economic growth. As a result, these new technologies will be widely used and become the new leading industry as well as the pillar industry of national economy.

In the process of industrialization, China is often asked the following questions: Is China already at a critical juncture of a new industrial revolution? Can traditional industries go any further? After China entered the second decade of the 21st century, excess capacity emerged as a prominent problem for some Chinese industries, so people began to wonder: since more and more industrial sectors or manufacturing links are to become "sunset industries" and thereby have to relocate to other countries, is China heading for "de-industrialization"?

Some developed countries used to hold the same doubt. Some people believed that when the industrial system was developed enough and the country was ready to enter the post-industrial era, industry would inevitably shrink and service industry would constitute the bulk of national economy. These developed countries had also been feared that the decline of industry especially the manufacturing industry would lead to the weakening of the country's industrial competitiveness and thereby the "hollowing-out of industry". In the 2008 global financial crisis, the United States saw a strong desire for "re-industrialization" and "revitalization of manufacturing" and the government did put them high on the economic agenda. So, will their experience be helpful to China? Have some Chinese industries already become "sunset industries"? What will China do after the establishment of a huge and complete industrial and economic system, to abandon industry (de-industrialization) or to further develop emerging industries?

All statistics and observable economic phenomena show that China's industry is far from a "sunset industry". All Chinese industrial sectors, ranging from the most traditional one to advanced manufacturing, still have huge potential for growth. At current prices, services' share of GDP has already grown. It is true that general processing and manufacturing industry can barely grow in some regions due to scarcity of resources and the rise in factor prices; but in some other regions, it is still very needy and thereby still has very huge growth potential. Therefore, some businesses relocated to other regions on such grounds. Take Foxconn Technology Group, an Original Equipment Manufacturer (OEM), as an example. Despite the fact that it could hardly expand its business in Shenzhen, Guangdong Province any further, it found great opportunities in central and western China, where it is extremely

popular and greatly needed. So far, it has built many larger production bases in many other provinces and municipal cities, such as Sichuan province, Chongqing municipality, and Henan province. So, it is still too early to talk about the so-called "sunset industry" or manufacturing industry relocating to other countries in large scale. The real purpose of China's industrial transformation and upgrading is not to "abandon" industry, but instead to "reinforce" it. Now, China must have its industrial system further upgraded so that the whole industry (including conventional and high-tech industries) could enter the world-class ranks, which is a pressing priority for its reform on industrial system.

To abandon industry means to abandon the carrier of technological innovation and the prospect of pushing the boundaries of industrial technology. Even the most developed regions in China should not abandon industrial activity, but instead they should serve as the growth poles of high-tech industries and advanced equipment manufacturing industry. Therefore, when conventional industries are highly developed, chances for demand growth are small, especially when new leading and pillar industries are particularly needed to boost economic growth, it will become a high priority to develop strategic, emerging industries. This is actually a tough issue faced by all developed countries. When a country's industry grows to the point that its manufacturing is highly developed, this country will inevitably begin to boost modern services. Notwithstanding this, China, as a major country, still cannot choose to "abandon manufacturing". Any major power cannot do without advanced manufacturing, an industry that should never die or decline. Otherwise, there would be no carrier of technological innovation and the whole country would thereby lose its edge.

Since the beginning of the 21st century, China has proposed to establish a modern industrial system. Transformation and upgrading of the industrial system does not simply mean to abandon the conventional industry and create an "enclave industry". There will still be some continuity in the process of industrialization even after a new industrial revolution and disruptive innovations. At the current stage, China's task is to set up a more advanced and developed industrial system for the middle and late stage of industrialization after the task of primary stage is basically completed, and all sectors of conventional industry will have ample space for technology upgrading. Surely, the technical route for China's industrial development and evolution of industrial system must change as well in due time after its entry into the late stage of industrialization.

China's industrial transformation has both continuity and discontinuity. Continuity refers to the trend that industry will continue to grow at a medium to high speed and all sectors of industry will undergo an all-round technology upgrading. Discontinuity is mainly reflected in the emergence of new industrial fields as a result of China's undertaking a new type of industrialization and seeking to optimize the industrial technical route on the basis of major and core technological innovation. Therefore, to establish a modern industrial system actually means to undertake a new type of industrialization and create an industrial system reflecting the features of such industrialization. It can be typically reflected in the following aspects:

First, major adjustment to resource strategies will be made.

In terms of energy strategy, adjustment to energy production and consumption structure will be made; that is to say, China is to promote the reform on energy production and utilization pattern and to establish a safe, stable, economic, clean and modern system of energy industry. On the one hand, China should promote high, efficient and clean use of conventional energy while ensuring security of energy supply; on the other, China should accelerate exploitation of new energy resources and promote gradually the replacement of fossil fuel with clean, renewable energy.

In terms of land and mineral resources strategy, China should enhance the role of land as "the mother of wealth", but in a controlled manner, in order to ensure scientific planning, intensive development, overall consideration and reasonable use of land resources. At the same time, a more scientific and reasonable way to develop and use strategic mineral resources will ensure a constant source of material supply for the modern industrial system in the long run.

In terms of ocean resources strategy, development of ocean economy is needed for more geographical space and resources for industrialization. China should adopt the strategy of land-sea coordination, formulating and implementing ocean development strategies to improve the country's capacity for exploitation, control and comprehensive management of ocean resources. It is necessary that China make a scientific planning, exploit and use ocean resources reasonably, develop offshore oil and gas, transportation, fishery industries, protect island, coastal zone and marine ecology, ensure secure sea lanes and safeguard maritime rights and interests.

Second, the three sectors of the economy are expected to be better proportioned and interact with each other more effectively.

China should improve and optimize the structure of industry, especially the manufacturing industry. More specifically, China should strengthen the intensification of production, making the manufacturing industry more environmentally friendly and sophisticated. Besides, it should create a sound industrial organizational structure ensuring effective competition, division of labor and cooperation among large, medium-sized and small manufacturing enterprises.

China should speed up the development of service sector, including producer services and consumer services. Once the manufacturing industry is developed enough, China should increase the proportion of service sector in national economy, that of modern services in the whole service industry, and that of producer services in modern services. Besides, metropolises should be stimulated to establish an industrial structure with service economy being the bulk of local economy and the high-end manufacturing industry especially core technology innovators being the centerpiece.

A reasonable division of labor and effective interaction will be achieved among the primary, secondary and tertiary industries. The primary industry serves as an important material basis for the secondary and tertiary industries; modernization of the primary industry is also the precondition for that of the other two; the secondary industry provides technical support for the primary and tertiary industry, and at the same time the former is also an important source of the latter's market demand; the tertiary industry not only provides the basic condition for the primary and secondary industries, but equips them with a highly efficient comprehensive transport system

and information transfer system; and moreover, it also provides the other two sectors with necessary support to ensure their high efficiency, branding and extension.

Third, strategic emerging industries will be nurtured and developed. China should focus on developing next-generation information technologies, energy-conserving and environment-friendly industry, new energy, biological industry, high-end equipment manufacturing industry, new material industry and new energy vehicle industry, stepping up efforts to create leading and pillar industries in order to broaden the space and prospect of industrial development. Currently, not only newly industrialized countries such as China need cultivate and develop emerging strategic industries, but developed countries such as the United States also need desperately develop them. That is to say, the whole world is looking for the answer to the key problem concerning the sustainable economic growth, i.e. What emerging industries will replace conventional industries and thereby become leading and pillar industries? And to what extent do they go? China and developed countries are almost on the same starting line as to how to deal with this great challenge. Through major transformations and industrial upgrading, China's industry is now approaching the most advanced level of the world. This is exactly what China's industry aims to achieve since the 12th Five-Year Plan, through the period of the 13th Five-Year Plan and even a much longer period, which is likely to become another milestone in the process of China's industrialization.

Fourth, indigenous innovation will be more strategically important. Industrial transformation and upgrading and the establishment of a modern industrial system are a process full of deep systematic changes, involving all aspects such as technology, system, interest and values. The key matter is to establish a system and mechanism favorable to indigenous innovation, especially core technological innovation. Industrial transformation essentially aims to shift from resource- and capital-driven industrial growth pattern to innovation-driven one, which marks one of the largest and most important differences between the primary stage of industrialization and the mid-late stage.

After China enters the mid-late stage of industrialization, its level of industrial technology is now approaching the world advanced level. In particular, modern industrial products' life cycle has been dramatically shortened and even high-tech products and high-end links of industrial chain have also become fields of sufficient competition. As a result, competitions on price and cost are highly related to technological innovation: technological innovations are not just meant for higher value added, but also for higher efficiency.

Industrial production essentially means to turn scientific inventions into mass market products through technological innovation, that is, to turn luxury of yesterday into today's high-end products and then into tomorrow's mass consumer goods. Its logic has been perfectly reflected in the widespread use of car, TV, computer, cell phone, etc. And the key to this logic lies in constant innovation: opening up of new production fields through constant innovation; gaining cost and efficiency advantages through constant innovation; seeking new ways to strengthen global competitiveness through constant innovation so as to set up a more advanced modern industrial system.

An important characteristic of modern industrial system is structural coordination. A balanced and reasonable industrial structure is a goal that most economies attempt to achieve, but such attempts often end up being less satisfactory. Even developed economies, whose industrial structure is regarded by developing countries as a benchmark against which to judge theirs, often find their own industrial structure flawed. Therefore, it is even more urgent for China to adjust the industrial structure, as the imbalanced, uncoordinated and unsustainable development has already been a very acute economic problem.

Industry and industrial structure are abstract economic terms used to define the complex reality of economy. In the real economic world, all kinds of economic activities are continuous, and there are no clear boundaries between them. To facilitate economic analysis, we can define some production activities that are fungible or have things in common as "industry", the relationship between all production units within the industry as "industrial organization", and the relationship between industries as "industrial structure" in a narrow sense. While in a broader sense, industry can be divided into several other types under different principles of division. For example, from the perspective of technical features, it can be divided into traditional industry, high-tech industry and emerging industry. Based on different features of essential factors in production, industry can also be divided into labor-intensive industry, capital-intensive industry, technology-intensive industry and resource-intensive industry. Therefore, even though these subdivisions are based on some objective standards, they are still subjective constructs; no concepts can be one hundred percent the same as the objective world; and moreover, there are always some grey areas between various concepts in the real world.

One must understand and define the term "industrial structure" before observing and discussing the "industrial system". The so-called "industrial structure" is actually a construct based on observation and analysis of relationships between various production activities and between agents, which have been classified into different types according to some criterion, such as demand-supply relationship, competitive relationship, and input-output relationship. Besides, it can even include observation and analysis of the relationship between various industrial activities and natural resources/environment. In other words, industrial structure is actually an observation and study of economic activities based on abstract classification and conceptual construct of complex realities. As a matter of fact, when we say "various" economic activities, we've already assumed that classification of complex economic activities is based on certain subjective standard. To put it another way, "industrial structure" and thus "industrial system" are concepts based on people's observation of economic activities from some perspective.

In different countries' different stages of economic development, people focus on different things from different perspectives for different purposes. For example, developed market economies are most concerned about the relationship between various enterprises within the same industry, mainly reflected in their high attention to monopoly, competition, concentration, enterprise behavior, market performance and the relationship between large, medium-sized and small enterprises. However, planned economies, developing countries and emerging economies often focus on

the relationship between industries, mainly reflected in their high attention to the proportional change and imbalance in the relationship between industry, agriculture and services, that between light and heavy industries and that between various industries.

To sum up, classification of industry is relative and imprecise, and results tend to vary according to statistical method. For example, if industry is considered a three-sector structure including the primary, secondary and tertiary sectors, various statistical indicators can be used to analyze the industrial structure, such as the number of persons employed, asset stock and the flow of outputs. When the flow of outputs is used as the indicator, different prices will be available, such as the current price, the price of certain year (fixed price), purchasing power parity and international price. Different statistical indicators and methods will yield different results on the proportion of each industry within the three-sector structure. Therefore, we must understand fully the effectiveness and limitations of industrial classification and statistical methods before conducting analysis of industrial structure.

So far, there hasn't been a set of indicator system capable of precisely reflecting the real situation of industrial structure, because people are actually using "discontinuous" concepts (with clear boundaries) to describe "continuous" reality (without clear boundaries), that is, to calculate dynamic, fluid things with static data. So, when it comes to the analysis of industrial structure, we must admit that people do have limitations in understanding. However, people who fail to realize it tend to pursue blindly certain targets (e.g., mandatory requirement on certain industry that its proportion or quantity must at least reach a certain point) in actual economic work as an absolutized policy goal for industrial development and industrial structural adjustment as well as a gauge of government performance, which more often than not leads to the industrial structure always being less satisfactory and even very hard to get into shape notwithstanding repeated adjustments.

In the history of China's industrialization spanning over 60 years, there has never been a period in which industrial structure is considered satisfactory or rational. In each economic plan made by the government, irrationality of industrial structure is always listed as one of the economic "problems", and to rationalize or optimize the industrial structure is thereby set as a "goal"; but such kind of goal seems to have never been reached. As a matter of fact, industrial structure is a complex compound organism whose components are closely linked with each other instead of being fitted together like jigsaw puzzle pieces, and therefore, industrial structural adjustment is essentially efforts to cultivate and adjust the compound organism rather than efforts to fit randomly pieces together.

Furthermore, the so-called "rational" industrial structure is not a very definite goal that even economics theory can hardly define very clearly. Whether a country's industrial structure is rational or not is though to some extent determined by objective reality, it also has a lot to do with selection of development goals. Objective reality mainly includes stage of economic development, market supply and demand, environmental resources, and international competition; while development goals might involve growth speed, the willingness to build up national strength, or welfare level. When it is mainly up to relative relations in objective reality, goals and paths will

also be selected by priority order. For example, a balanced path might be given priority over an unbalanced path, or the other way around. If selection of development goals matters most, people must also consider objective conditions and the balance between all relative relations, which will be ignored at their peril. Just as a proverb goes, "More haste, less speed".

The industrial structure changed very rapidly in the period of industrialization, and therefore, whether an industrial structure is reasonable is not a simple matter of static proportion, but something reflected in a dynamic process instead. The creation and evolution of a particular industrial structure has both historical reasons and realistic conditions. In the period of industrialization, the industrial structure of different countries did present some normal features and tended to change in certain patterns, so economists generalized from changes in developed countries' industrial structure and came up with a "benchmark" against which to judge late-developing countries' industrial structure. However, the claim that "the average industrial structure of most developed countries is the one that is reasonable" is obviously not very well-founded. National conditions differ sharply from country to country; most countries' industrialization occurs in an era of rapid world development, different from the period of developed countries' industrialization; and furthermore, based on different development goals, different countries tend to choose different strategies and modes of development as well as different political and economic systems. Therefore, there isn't a standard answer to the question as to what is rational industrial structure.

China's industrial structure of the current stage was formed during its transition from planned economy to market economy and the period of industrialization acceleration. Since the end of the 1970s, China chose incremental reforms and "differential development" to advance industrialization. At the very beginning, China set as the primary goal "to get rid of poverty as soon as possible" and proposed that "development is of overriding importance", so the structural reform was not carried out simultaneously within each economy. Besides, incremental reforms often went hand in hand with special policies and preferential treatment, encouraging some people and some regions to "reform first", "develop first" and "get rich first". In this sense, people and regions were not provided with equal opportunities, and thereby their developments were highly differential. In other words, some people, regions and industries were allowed to develop and prosper first, while others would achieve it later. Such differential development manifested itself in industrial structure as sever imbalance in profitability (profit rate) among industries and huge differences in industrial development policies among different regions.

Such reform and development path wasn't adjusted until the second decade of the 21st century, and therefore, the Chinese government intervened fully in competitions among different regions and industries in the period of industrialization acceleration. In terms of regional development, local governments granted preferential policies and differential industrial polices especially investment approvals (gaining approvals from the government means access to preferential treatment and subsidies), resulting in market players competing fiercely for preferential treatment. The regions offering preferential policies to enterprises developed first, and the industries favored and supported by governments grew rapidly, too. Economic resources were poured into

highly profitable industries, causing such industries to expand in a gushing manner. Governments selected policies to accommodate to market force, that is to say, these selective policies adopted by governments boosted the role of market, and competitors (enterprises) thereby elected to seek rents while striving to innovate (introducing preferential policies to production function). Such development path did create China's economic miracle, but it has also led to a more severe structural imbalance despite the fact that the impetus for economic growth has thereby increased.

As a result, China's industrialization path was then typically featured by "horizontal growth". That is to say, China's great endeavors to attract investment and huge horizontal investment in fields with comparative advantages promoted by government have led to immense production capacity and rapid occupation of markets both at home and abroad. China has thereafter grown into the world's second largest economy within just two to three decades, but such mode of economic growth also has many limitations, such as low-level technology, homogenous products and lack of motivation for innovation. Enterprises tended to scramble for "preferential policies" and comparative advantages in resources, but seldom settled down to technological innovation; their behaviors just aimed for short-term benefits, hugely lacking patience and determination for continuous innovation. Governments tended to draw investment in industries with plenty of room for horizontal expansion and do the utmost to offer cheap land and fiscal preferential policies, which actually means to boost horizontal growth by granting subsidies directly or indirectly.

China's industrial output has increased rapidly as a result of several decades' horizontal growth, but at the same time such growth also led to excess production capacity. Governments did contribute to economic and political achievements by boosting the role of market, but they more often than not overexerted themselves by encouraging and subsidizing the capacity hard to digest on the part of market. When imbalanced industrial structure stood out among various problems, governments always expected to turn the tide through direct regulation, such as promoting or restricting some industries, and in the end they had to resort to administrative means to forcibly phase out some backward capacity. However, these regulation efforts more often than not backfired. By 2013, overcapacity was already so acute a problem that the Chinese government had to set as the primary goal "to phase out overcapacity" in times of urgent need.

China's current problems with industrial structure have very deep roots. Industrial upgrading is not a simple matter of adjusting the proportion of each sector of the economy, but instead it is in constant flux like evolving ecosystems. Only a diversified, dynamic and highly adaptable industrial structure can achieve dynamic optimization. But China's industrial structure mainly has the following two problems. The first one is homogeneity and monotony. Products tend to be homogenous, industries and parks isomorphic, and urban construction is stereotyped, too. Homogenous and monotonous industries will surely have low added value and excess production capacity. The second one is that China's industrial structure is very obviously an over-arranged construct, which therefore lacks dynamism and adaptability that an organism is supposed to have. Therefore, the government cannot adjust industrial structure just for the sake of meeting certain requirements for proportions at the

expense of individual dynamism. In 2015, the Central Committee proposed to attach more importance to "supply-side structural reforms", the exact antidote to the current problem.

Fundamentally, only when incremental reforms are successfully completed, when "differential development" turns into "balanced development", and when the role of government shifts from granting preferential treatment to ensuring fair competition and equal opportunities, will the industrial structure possibly be more balanced and coordinated. Objectively speaking, China still needs some time to reach that stage, and the fairly imbalanced structure will continue to exist for a period of time. However, it does not mean that the government can do nothing about the imbalanced industrial structure. In October, 2015, the Central Committee of the Communist Party of China issued *Recommendations for the 13th Five-year plan for Economic and Social Development*, proposing a new notion of economic development, i.e., to advance innovative, coordinated, green, and open development that is for everyone, which marks the beginning of a new era.

Chapter 6
Seeking Balance: Resource Conservation, Environmental Protection and Industrial Development

Those who love to talk about how to keep fit and healthy often tell us what kind of food is healthy and what is not. As a matter of fact, I am afraid there is almost nothing that human beings haven't ever tasted or eaten in the long history of human evolution spanning millions of years. There might be only one indisputable truth that matters the most to humans, which is, eating less does good while eating too much does harm. Too many metals in the water would result in heavy-metal pollution; water containing a few metals is called "mineral water" or "hot-spring water"; as for water without any impurities, humans are unable to enjoy it. Too high sound is called noise and might do harm to health; but humans cannot live in a world without any sound. It is said that deadly white arsenic (Arsenic trioxide) is also a cure for leukemia. Such discovery will probably make Chinese medical scientists win a world medical prize or even another Nobel Prize in medicine.

A few words eulogizing industrialization ever appeared on a textbook for primary school students in the 1950s, "Smoke pours out from the factor chimney into the sky in the shape of peony, forming a beautiful ink wash painting"; however, the factories whose smokestack chimneys belching heavy smoke into the atmosphere are nowadays either forced to close down or fined. Sparsely populated cities are called "ghost cities", while densely populated cities suffer "metropolitan diseases" and are labelled as "places not good to live in". Urban people who have seen too many high-rise buildings want beautiful country scene, i.e., green hills and blue waters to stay away from the hustle and bustle; whereas rural people who always live a serene countryside life envy very much the hustle and bustle of the city full of high-rise buildings.

Humans are always bothered by having too much or too little. They lust for what they don't have and don't appreciate what they already have. In the process of industrialization, humans are always bothered by such problem, that is, after they gained something and lost something, they always lament what they have lost and keep asking themselves whether the loss outweighs the gain. So, what is just perfect? How can one have his bread buttered on both sides? How to be satisfied? Maybe there is only one passable answer, that is, to keep weighing things up and try to strike a basic balance.

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6.1 Industrialization Is a Process of Resource Creation and Consumption

Industrialization is a process in which humans explore and use natural resources heavily and deeply. After completion of industrialization, developed countries have achieved plenty of fruitful results and become modern countries. Once industrialization started in developing countries, resource-based industrialization would inevitably spread across the globe. In China, the resource route of traditional industrialization has strongly manifested itself in the process of industrialization. Both achievements and the price are the inevitable result of objective laws: even though developing countries can learn from the past "mistakes" of developed countries, it seems still impossible for them to find a perfect way to just benefit from a certain resource route without paying a price. Indeed, industrialization might lead the world to "Paradise" or "Hell", that is to say, it will probably turn the world into a place more developed and even better to live, or have the natural environment and resources vital to human life severely damaged so that the Earth is rendered uninhabitable. Therefore, the resource route of industrialization is not only a result of objective laws that are independent of man's will, but a very critical choice concerning the fate of human beings.

In the process of industrialization, natural materials that can be turned into "resources" and put into industrial use in large scale mainly fall into the following four categories: land, water, energy and raw materials (including minerals and living organisms). They have three things in common: first, their reserves are all very large; second, they are all easy to get and transform physically; third, there is economy in exploitation and use of them in current technical conditions, and no cheaper alternatives are available in large quantities. Industrial production is a process of transforming the physical form of natural materials through prospecting, mining, storing, transporting, processing, etc. and turning "things-in-themselves" into "things-for-us". The issue of resources is essentially a problem concerning industrial technical route, resource route and the level of industrial development.

China's industrialization can neither skip any major stage that world industrialization must undergo, nor find an entirely new technical or resource route. But what sets it apart from others is that China, the huge economy accounting for 20% of the world population, is expected to complete such process just within several decades (at most 100 years) and thereafter become an industrial society. Before completion of such process, China must be well prepared for any unprecedented phenomena or problems that have never ever been so prominent in the history of world industrialization. Accordingly, its industrialization must be more innovative so as to overcome tougher issues resulting from internal imbalance and external incoordination.

In December, 2007, Information office of the State Council of the People's Republic of China issued a white paper book entitled *China's Energy Conditions and Policies,* which summarizes the features of China's energy resources.

First, China has very large energy reserves. China has huge fossil energy resources, among which coal is the main energy source. China has the third largest proven coal

reserves, accounting for 13% of the world. Proven reserves of petrol and natural gas are relatively insufficient, but non-conventional fossil fuels such as oil shale, coal-bed methane have rather large potentials. Besides, China is abundant in renewable energy resources. In theory, China has the world largest water reserves, accounting for 12% of the world.

Second, China's energy resources per capita are fairly low. As China has a very large population, its energy resources per head are very low compared to other countries in the world. Its coal and water resources per capita is only 50% of the world average; its petrol and natural gas resources per capita are just 1/15 of the world average; its land resources per capita is even less than 30% of the world average, which has inhibited the exploitation of biomass energy.

Third, energy resources are not evenly distributed in China. China's energy resources are widely but unevenly distributed. Coal reserves are mainly distributed in north and north-west China, water resources in south-west China, and petrol and natural gas reserves in the eastern, central, western regions and seas of China. But China's major energy consumption regions are mainly distributed in developed southeast coastal areas. One can observe very easily the mismatch between energy-resource endowment distribution pattern and energy consumption distribution pattern in China. As a result, long-distance and large-scale coal and oil transportation from North China to South China, west-east gas pipeline and west-east electricity transmission have become the most typical features of China's energy flows and the basic energy transportation pattern.

Fourth, exploitation of China's energy resources is rather hard. Compared with other countries, China's geological conditions for coal mining are rather poor: most coal reserves need underground mining, and very few coal reserves are available for open-pit mining. Besides, the geological conditions for petrol and natural gas resources are also very complex, such as deep deposit, thereby having higher requirements for prospecting and exploitation technology. As untapped water resources are mainly distributed in the deep valleys of southeast China far away from load centers, the costs of exploitation will be rather high. In contrast, non-conventional energy resources are easier to explore, but not economic or competitive.[1]

6.2 China's Industrialization in the Face of Resource Constraints

The history of world industrialization shows that people are more inclined to use abundant resources with lower costs in exploitation and processing, rather than scarce resources or resources with higher costs. As a result, the resources industry risks running out of are often natural resources the Earth used to be abundant in. For example, petrol, coal, water are most abundant resources in the Earth, which however

[1] See: *China's Energy Conditions and Policies*, by Information Office of the State Council of the People's Republic of China, December, 2007.

still risk being used up locally or globally after being put into industrial use on account of huge industrial expansion. It not only applies to energy and mineral resources, but to seemingly inexhaustible water resources, which also risk being exhausted. What is interesting is that what happens to abundant natural resources will never happen to truly scarce resources, because no industrialization has ever been or will be based on large-scale use of scarce resources. So, only if needed by industrialization will natural resources become industrial resources. However, driven by a strong desire for industrial development, the world can run out of any natural resources on account of unchecked consumption.[2]

Whether industrial resources are in short supply is reflected in the relationship between their supply and demand, which is often related to prices. From the perspective of industrial resource route selection, abundant resources easy to get are often put into industrial use as major resources. Due to ample supply, they can be used at very low prices and even freely, which will therefore lead to higher and higher demand. When demand exceeds a certain level they will be in short supply. However, as shortage is always related to prices, industrial resource shortage will not widely happen in theory so long as price has infinite elasticity. But the reality is that prices of natural resources that can be exploited and used in large scale are not that elastic for various reasons, or that the society can hardly bear too sharp fluctuations in the price of these resources. In general, industrial resources fall into several types as follows according to price features.

The first type is resources with a never-ending supply relative to effective demand, and therefore they can be called non-scarce resources. Their price is zero, i.e., they are free, such as sunlight, air, sea water. In the pre-industrial period, freshwater also belonged to this type in most countries and regions. This type of resources is in endless supply.

The second type is resources in limited supply whose prices are entirely determined by the market, which can also be called scarce resources. In theory, such resources, including most scarce resources, will never risk being used up, because their prices will be "extremely high". This type of resources has an infinite elastic supply.

The third type is scare resources that must be widely supplied. As such resources are indispensable to normal life and production, they must be widely supplied in not too high prices. Under pressure, the government has to step into control their prices. Once the price mechanism fails, supply "shortage" will be strongly felt, that is, supply will fall short of demand at a certain price level. If the state cannot regulate the price of these resources effectively, the price will rise to the extent that the society can not bear and is thereby plunged into a serious social crisis. So, resource supply shortage is related to price control or tolerance of price fluctuations, and such tolerance is usually the direct cause of price control.

To sum up, the issue of "resource shortage" all comes down to price and tolerance of price fluctuations in the end. It mainly involves the following two basic things: first, to what extent is supply and demand of a certain widely-used industrial resource

[2]See Jin (2005).

determined by the price mechanism? Second, what is the maximum price fluctuation (usually rise in price) that the society can bear? In reality, the two issues are mutually constraining. As the society usually cannot tolerate too wide fluctuations in the price of resources, their supply and demand cannot be entirely determined by the market; or in other cases when prices must be controlled within a tolerable range, their supply will thereby fall short of demand.

This is one of the reasons why common manufactured products are usually not in short supply, but resources risk running short. On the one hand, common manufactured products have large elasticity of supply, and will thereby be less likely to be bounded directly by natural conditions; on the other hand, as for most manufactured products, there is no limit for price fluctuations, that is to say, so long as their supply falls short of demand, the price will rise and serious social and economic problems will be thereby avoided. However, as for widely-used resources that are essential for industrial production and life, the society will be highly sensitive to fluctuations in their price. So, when price fluctuations (usually price rise) go beyond tolerance, the society (or the state) will have to step into control their prices by various means.

As for which category industrial resources fall into, it is not always invariable; rather, the same resources might present different features in different countries or different periods of time. In the real economic world, whether some resource is in short supply might depend on circumstances. First, it might depend on the country's natural reserves or available quantity, which is related to natural resource endowment and terms of international trade. Second, it might depend on the proven reserves or potential supply of renewable resources, which is related to exploitation investment and technology. Third, it might depend on real production and supply of resources, which is related to production capacity and transport capacity and determined by technology, investment, and the interplay of various factors crucial to production capacity. Fourth, it might depend on real supply and demand of resources, which is up to the market price. In a nutshell, reserves, investment, capacity (including transport capacity), price (mechanism and tolerance) are the four basic aspects of the issue of industrial resources, and price features of different resources are at the core of the problem of supply and demand.

In the process of industrialization in China, resource constraints are in the first place the matter of price directly related to supply and demand, and then the matter of production capacity and investment, and finally the issue of natural reserves. The resource route that China has adopted in the process of industrialization is typically featured by the following aspects.

1. China's Large-scale Industrial Expansion Is Based on Low-price Resources.

China's global comparative advantages contributing to its industrial growth include not only abundant labor force, but in particular the huge supply of low-price resources to industrial enterprises especially foreign enterprises. On the one hand, in the early period of industrialization when various resources, no matter land, water, mineral resources or energy, were all relatively abundant and easily available, the price of domestic resources was substantially lower than the international level. On the other hand, in order to contend for relatively scarce capital especially foreign capital and

technology, the central government and local governments at all levels all adopted "preferential policies" to promote industrialization, which is essentially the use of policy tools to lower resource prices. For example, they supplied land for industrial use at low or zero prices or even with subsidies, made sure water and electricity would be supplied at low prices and formulated rules and regulations on tax exemptions and reductions in order to attract more industrial investment and enhance the price competitiveness of industrial products.

Provided with low-price resources, China's industry was propelled to grow at a high speed, its production being greatly expanded and its capacity significantly improved as well. However, the problem is that huge dependence on low-price resources is not sustainable development despite historical reasons. People have now strongly felt the pressure from an increasing rise in industrial resource prices and thereby realized that China's industrial production shouldn't be built on low-price resources any more. As a matter of fact, China's advantages in low-price resources have already disappeared in many fields.

2. China must deal with the problems arising from the mismatch between China's primary energy structure and the industrial technical route transferred from western countries in the process of industrialization.

China's resource endowment determines that coal, one of primary sources, is its main source of energy (see Table 6.1); but the industrial technical route led by western industrial countries requires that petrol and natural gas be major sources of energy (see Fig. 6.1). If China advances industrialization in the same route as the western world did it, a great mismatch between China's resource endowment, i.e., coal being the major source of energy, and the industrial technical route adapted to the Petroleum Age that the world is currently in, will be strongly felt and thereby give rise to many problems and even threaten energy security. It is impossible for China, as a late-developing industrial power, to adopt an entirely new industrial technical route to adapt to its resource endowment so as to differentiate it from the western world's industrial technical route in most industrial production sectors and modes of transportation.

As a result, China's industrialization will surely be severely affected by the structure of resource supply due to its resource endowment. Industrial production mainly consumes secondary energy (electric power), but in China, its electric power sector mainly consumes coal. The coal-fired electricity generation is a "compromise" between China's energy production structure and the modern industrial technical route. Therefore, China's industrial products especially transportation industry determined by the industrial technical route are severely affected by its resource endowment, which is typically reflected in petrol supply constraints, i.e., imbalance between supply and demand for petroleum. Surely, such energy structural problem can be overcome by international trade, but considerable price will be paid accordingly.

3. Energy substitution needs plausible solutions.

Fossil fuels are currently still in their prime. Petrol and coal are still the most economic, the best available and the safest sources of energy, and they can still be

Table 6.1 China's energy output and sources unit: million metric ton (MMT) of standard coal equivalent (TCE)

Year	Total energy output	Sources of energy			
		Raw Coal	Crude oil	Natural gas	Hydropower, nuclear power, wind power
1978	627.70	441.27	148.76	18.20	19.46
1980	637.35	442.32	151.69	19.12	24.22
1985	855.46	622.77	178.79	17.11	36.78
1990	1039.22	771.10	197.45	20.78	49.88
1996	1330.32	997.74	224.82	26.61	81.15
1997	1334.60	991.61	229.55	28.03	86.75
1998	1298.34	951.68	229.81	28.56	88.29
1999	1319.35	975.00	228.25	32.98	83.12
2000	1385.70	1010.17	232.80	36.03	106.70
2001	1474.25	1070.31	234.41	39.80	129.73
2002	1562.77	1142.38	239.10	43.76	137.52
2003	1782.99	1349.72	242.49	46.36	144.42
2004	2061.08	1580.85	251.45	55.65	173.13
2005	2290.37	1772.74	258.81	66.42	192.39
2006	2447.63	1896.91	264.34	78.32	208.05
2007	2641.73	2055.26	266.81	92.46	227.19
2008	2774.19	2130.58	271.87	108.19	263.55
2009	2860.92	2197.19	268.93	114.44	280.37
2010	3121.25	2378.39	290.28	127.97	324.61
2011	3401.78	2646.58	289.15	139.47	326.57
2012	3510.41	2674.93	298.38	143.93	393.17
2013	3587.84	2705.23	301.38	157.86	423.36
2014	3600.00	2635.20	302.40	172.80	493.20

Source China Statistical Yearbook (2015); data in 2014 come from National Bureau of Statistics database

exploited and used for a rather long period of time. The journey to energy substitution will be full of formidable challenges. In the process of industrialization, China must solve the following three key issues.

First, two requirements need to be met in order to develop new energy sources. One is to ensure positive "net energy income", i.e., new energy output must exceed the consumption of fossil fuels and other resources. The other one is to ensure that new energy must eventually outdo fossil fuels in terms of economic efficiency, that is to say, the cost of new energy must be lower than that of fossil fuels. Before the first requirement is met, the pains of developing new energy sources might not lead to too many gains; when the first requirement has already been met but the second

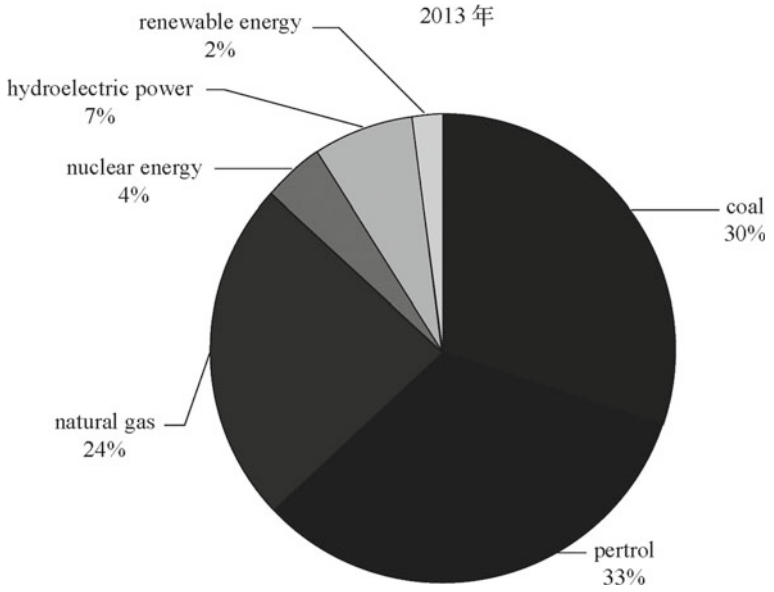

Fig. 6.1 World energy structures

hasn't, new energy industry might still not be competitive enough. By then, the government should give a boost to new energy industries such as granting subsidies; but in the meantime it should also try to avoid any rent-seeking, which otherwise would discourage substantive innovations and result in a waste of social resources.

Second, breakthroughs in core technology are needed for the development of new energy sources. So far, China is still expecting a breakthrough in key technologies and the technical route of commercialization hasn't been found yet. In such circumstance, it will be imprudent for China to invest, for it will carry huge risks. Only if China possesses the most advanced technology vital to the development and use of new energy will energy substitution probably be called a real success. As a matter of fact, China has repeatedly got the opposite of what it wanted while striving to develop new energy sources. Disregarding the fact that it still hasn't achieved a breakthrough in core technologies and that demand for such new energy is still uncertain, China acted rashly and made a huge investment; and to add insult to injury, the government has given the green light to it. It has not only resulted in severe overcapacity and financial difficulties, but risked ruining the very market conditions for substantive core technology breakthrough and eventually leading to a wrong technical route of energy substitution.

Third, an incentive and constraint mechanism for cost sharing should be established. As energy substitution is a process of innovation with high costs and high investment risks, an effective incentive and constraint mechanism for cost sharing

must be established in the first place. And more importantly, as energy substitution technological innovation has very high externalities, irrational mechanism, system and policies would hardly ensure substantive technological progress and even probably lead to severely distorted behavior and a waste of resources.

4. Heavy-chemical industry is an important industry that China cannot do without.

Processing and manufacturing industry having experienced one to two decades' rapid growth, heavy-chemical industry begun to grow with strong momentum, resulting in both large demand for resources and great pressures on the environment. In the meantime, it is also very necessary for China to further develop heavy-chemical industry in order to remove resource and environmental bottlenecks. In general, heavy-chemical industry tends to consume more resources than light industry and most processing and manufacturing industries, and therefore, its rapid growth will inevitably translate into high resource consumption. In view of this, some scholars argued that China should skip the phase of high-chemical industrial development and directly develop high-tech industry and modern services to avoid resource scarcity.

However, the reality is that China, a huge populous developing country with vast land, can hardly solve any major, long-term economic or social problem at present or in future without the rapid and sound development of heavy-chemical industry. Only a developed heavy-chemical industry can resolve the problems concerning urbanization, communications and transportation, land management, resource exploitation, water conservancy, environmental protection, land governance, national security, people's livelihood and welfare. And moreover, high-tech industry and modern services also need infrastructure, office equipment and means of communications and transportation, which has thereby provided "demand space" for high-chemical industry as well. In other words, neither high-tech industry nor modern services can develop without heavy-chemical industry. In the meantime, the lives of urban and rural Chinese residents have also been thereby greatly improved. All investments or services, be it transport, housing, education, tourism, or health care, are directly or indirectly related to heavy chemical industry. It can thus be seen that, in a certain stage of industrialization, the high-speed growth of heavy-chemical industry is an objective necessity independent of man's will. Although heavy-chemical industry is highly resource-consuming and not friendly to the environment, a highly developed one is still the key solution to China's resources and environmental problems.

5. land and water scarcity and the problem of hitting the ecological carrying capacity in industrial concentration regions have become prominent constraints.

China's resource endowment is in general very sufficient for industrial development, and therefore its natural resource reserves and potential supply cannot be called absolute barriers to industrialization. As a matter of fact, industry can make better use of water and land resource than traditional agriculture does, that is, the former tends to consume less water and use less land. Our study shows that water consumption per ten thousand-yuan industrial added value has decreased drastically notwithstanding an increase in the proportion of industrial water use. Both energy consumption per ten-thousand yuan industrial added value and GDP per unit of energy use have declined

year by year. Besides, there is still very ample space for land development across the country. Therefore, viewed in the long term and total reserves, water, energy and land should not have become the insurmountable bottleneck for China's industrial development.

But the problem is that different resources have different fluidity. Generally speaking, The less fluidity a resource has, the more likely it would lead to local bottlenecks; as for the resources with high fluidity, they will be mainly constrained by aggregate supply and demand. To put it more specifically:

(1) Among various resources, energy is most fluid. Fossil fuels can stand direct and long-distance transport, and primary energy can be transformed into secondary energy for long-distance transport. In contrast, mineral resources are less fluid, which can be transported directly or after being processed.
(2) The fluidity of water resources is rather low, unless water flows naturally along the river or is diverted artificially to nearby places. The costs of long-distance diversion of (river) water are very high, and diversion of underground water lacks economic feasibility. As a result, water resource distribution pattern is very hard to change.
(3) Land and environment are basically immobile in terms of physical forms. Efforts to change the supply of land and environmental resources through "land reclaimation" and "environmental projects" are just a way to replace land and environment with capital; "land replacement" and "environmental trade" just contribute to resource fluidity in economic sense.

Therefore, rather different from the aggregate supply and demand of energy and mineral resources, the supply and demand of water resources, land resources and ecological carrying capacity varies from region to region. So, in regions of highly industrial concentration, their supply and demand might be severely constrained.[3] Such constraint has become more and more prominent in some industrial concentration cities and regions. China has a rather high industrial concentration. According to some statistics, industrial land of the United States only accounts for 7.3% of urban land, but 21% of urban land in China has been put into industrial use. So it can be seen that an increasingly higher industrial concentration has led to excessive use of land and water resources, water shortage and contamination, as well as extreme environmental pressures.

6. High-speed industrial growth has put a lot of pressure on resources.

Since the reform and opening-up in late 1970s and early 1980s, China's economy has continued to grow at high speed for over 30 years, with typical features of "compression of time" and "rapidity". Some features that usually manifest themselves in

[3] In many regions, not only production water supply is very tight, but drinking water security is also severely threatened. According to statistics, the rural population with insecure drinking problems accounts for 34% of the whole rural population. Those who fail to reach drinking water standard in terms of water volume, convenience, or reliability account for 30% of the abovementioned rural population, while those who fail to reach drinking water standard in terms of water quality account for 70%. (Guo 2007).

a particular stage of other countries' economic development spanning a rather long period of time often occur within just a very short period of time or concur with others during China's industrialization. For instance, some economist divides a country's economic development into four stages: resource-driven development, investment-driven development, innovation-driven development, and wealth-driven development, each of which has distinctive features. However, the features of these four stages seem to have occurred simultaneously in the current stage of China's economic development: large-scale resource exploitation (high-speed growth in resource-based industry), capital input (high saving and high investment), business model innovation (business model innovations appeared one after another despite insufficient technological innovation), and wealth multiplication (frequent capital manipulations, asset price inflation, dynamism of virtual economy). And therefore, it took China only a very short period of time to move from low-cost resource stage to the stage featured by a general rise in resource costs, but at the same time, it still kept many features peculiar to "resource-driven" and "investment-driven" stages. As a result, resource constraints on China's industrialization are very unique and urgent issues.

7. China's huge population has a special influence on the resource route of industrialization

Statistical data alone can indicate a huge imbalance in China's industrialization. Judged from the composition of gross domestic product, China is already an industrial country and at least in the mid-late stage of industrialization, with some rather developed regions having entered a mature stage of industrialization and taken on post-industrialization features. However, if judged from population composition or working population, China is still a country mainly composed of agricultural population and therefore hard to be called an industrial country at all.

The fact that China is now "an industrial country mainly composed of rural population" is both a typical feature and immense problem of China's economy, which will surely lead to a huge per capita income gap between rural and urban people and a severe imbalance in economic and social development. In particular, if China still wants to rely on the rapid development of non-agricultural sectors of the economy (i.e., the secondary industry and tertiary industry) to help more rural population achieve de-agriculturalization and urbanization, it must speed up urban construction, which will thereby require intensive efforts on the development of heavy industries such as electric power, energy, metallurgy, building materials, chemical industry, equipment manufacturing, transportation facilities manufacturing. However, such development strategy might lead to the reoccurrence of many phenomena such as "excessive investment", "resource constraint", "environmental damages", "a rise in real estate prices".

Due to such national conditions, the pendulum of china's economic policies swung back and forth between "urbanization" (encouraging rural people to migrate to the urban area) and "de-agriculturalization" (keeping them in the rural area by developing rural industry). In the 1950s, people's commune system was established in order to retain local people in the rural area. Since the 1970s, the government began to support rural industry, encouraging rural people to work in township and village enterprises

in the hope that they will not leave their hometown. In the 1980s, the government still encouraged township construction in an effort to keep rural residents in their hometowns, as it feared that rural migrants pouring into medium-sized and large cities might render these cities overcrowded and under-supplied.

However, due to the fact that industrialization and urbanization were so enticing to rural people as it could register them as permanent urban residents and that more urban population were then needed to support urban construction and boost urban economic growth, the government had to loosen its grip on urban household registration management, encouraging more rural people to migrate to cities by promising to register them later as permanent urban residents as a key way to narrow the urban-rural gap. By the 21st century, the Chinese government has made it very clear that it should step up efforts to achieve industrialization, IT application, urbanization and agricultural modernization simultaneously as a major policy of economic and social development, which is also considered the most effective, plausible, and the most environment-friendly way to ensure de-agriculturalization. Surely, if urban construction is too slow, such policies will lead to crowdedness in medium-sized and large cities and other issues associated with big cities. Anyway, "the backward countryside" and "overcrowded cities" are two mutually-constraining tricky problems that stand in the way of China's industrialization. Therefore, China's decision to keep advancing industrialization, urbanization and new rural construction is an inevitable result of its resource endowment and real national conditions. All in all, in the process of China's industrialization, industrial product structural adjustment is relatively easy to achieve, but the structural change of population composition, such as working, urban and rural population, is a rather hard goal to attain.

Resource constraint of China's industrialization definitely doesn't mean to abandon industrial development, that is to say, it doesn't mean to slow down and even avoid industrialization in order to conserve resources and overcome resource shortage. Just to the contrary, only by advancing industrialization as soon as possible will China's resource problems be solved. Even though resource shortage is somewhat a constraint on industrial growth, it is even bigger as a constraint on the growth of the whole economy![4] To prevent resource shortage from hampering economic growth and development is the very historical mission that industrialization is to accomplish. In other words, mankind must advance industrialization to mitigate and overcome resource shortage at a certain stage (and China is currently in this stage).

Resource constraints are inevitable in the process of industrialization. But it is stupid to give up eating for fear of choking. Resource shortage would get even tougher without industrialization. In the pre-industrial era, the world population was less than one billion, but now it is already 7 billion; before the founding of the People's Republic of China, China's population was just 0.4 billion, but now it has already exceeded 1.3 billion. Without industrialization, the resources on the earth would not be enough to support so many people at all; by comparison, industrialization can

[4]For example, our study shows that the resistance of land resource constraint on China's industrial growth is 0.47%, but the resistance of land resource constraint on the growth of the whole economy is 1.53%.

not only provide such a large population with plenty of resources, but improve the quality of their lives as well.

Therefore, the crux of the matter is not whether to speed up industrialization, but how to do it, i.e.. how to make the best use of limited resources. Industrialization resource route is essentially the path taken to ensure industrial economic efficiency and a scientific selection of ways to exploit and use resources, which means resources will be used in an economic, effective and feasible manner to advance industrialization, and proper systems and policies suited to certain resource technical route will be established through constant deepening of reforms.

8. Government regulatory system and policies on resources and energy vary from phase to phase

When it comes to the arrangement of resource regulatory system and policies, we must realize that, different stages of economic and social development might have different orders of priority for goals. For example, in the primary stage of economic development, industrial development is more important than resource efficiency and environmental protection; but as industrialization moves onto higher stages, resource efficiency especially environmental quality is increasingly valued. Therefore, in the primary stage of industrialization, systems and policies were more inclined to encourage industrial development, but with the improvement of the level of development, systems and policies tend to incline towards resource efficiency and environmental quality. That is to say, basic social values vary from stage to stage, and government policies and goals are not totally the same in different stages, too. High consumption is a typical feature of traditional industrial technical route and resource route, which is related to the then stage of development, but it does not mean that problems arising from traditional industrialization resource route should be overlooked.

Currently, China has already entered the middle stage of industrialization, and some Chinese regions even the late stage. In terms of social value basis, resource efficiency and environmental quality are more valued; but in terms of technology and institutional incentives, resource efficiency and environmental quality still tend to be undervalued. In many circumstances, enterprises and local governments are still relying on huge resource input to gain advantages in competitions but at the expense of environment. Such behavior results from backward concepts and slow reforms, as well as the fact that many regulations and policies are still not compatible with incentives for resource conservation and environmental protection. This is the very weakness that China is trying to overcome.

All in all, as far as the technical nature is concerned, industrialization is a process in which natural resources are exploited and used more efficiently and then manufactured and processed into products that meet people's needs. It is a process of social development in which the industrial mode of production has become the leading and dominant mode of production. Industrialization requires that natural resources be exploited and used in large scale, and as for whether substance on the earth can become "resources", it all depends on industrial technical route and resource route. Industrialization resource route determines that mankind can divide substance on the earth into "resources" and "wastes", any "waste" can be turned into "resource" under

certain industrial technical route, and vice versa. Strong creative power of industrialization (which also means huge material consumption) can also turn substance that the earth used to be abundant in into scarce resources or resources that are running short.

The reality is that the technical level of industry is always limited, and therefore natural substance is divided into "resources" that can be utilized and "wastes" that cannot be used temporarily. Though more and more wastes are being turned into resources in the process of industrialization, natural resources necessary for industrial production seem to be always running short; and moreover, large-scale industrial production tends to cause huge demand and thereby make the earth run low on some resources. And China makes no exception: the large-scale exploitation and use of natural resources is also the initial conditions for industrialization, though not the only conditions.

After all, resource input is not the major determining factor of industrialization, but the technical ability to turn substances on the earth into more resources is. However abundant resources a country has, it would still end up going nowhere if it just relies on resources to achieve industrial growth. In particular, nobody thinks that China, with a huge population, can for ever rely on its advantage in natural resources to achieve industrialization. As for China's industrialization path, the level of industrial technology and innovation ability are of more fundamental importance than resources. With the improvement of technical level and the upgrading of industrial structure, resource utilization efficiency is also being improved. For example, in the period of China's industrialization acceleration, energy consumption per unit of GDP declines sharply despite a huge increase in the scale of industrial production including heavy and chemical industrial production (see Fig. 6.2). This is mostly attributed to the decrease in energy consumption per unit of industrial added value (see Fig. 6.3).

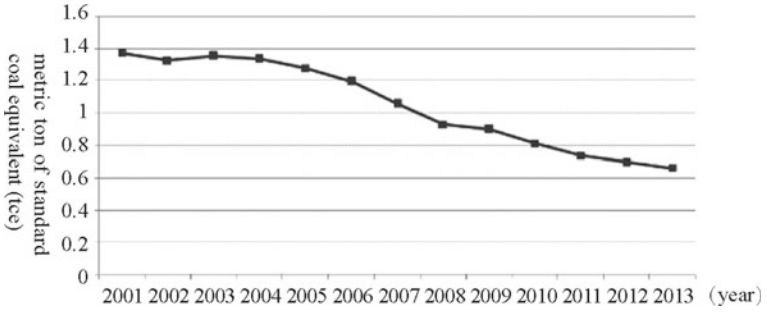

Fig. 6.2 China's energy consumption per unit of GDP (2001–2013)

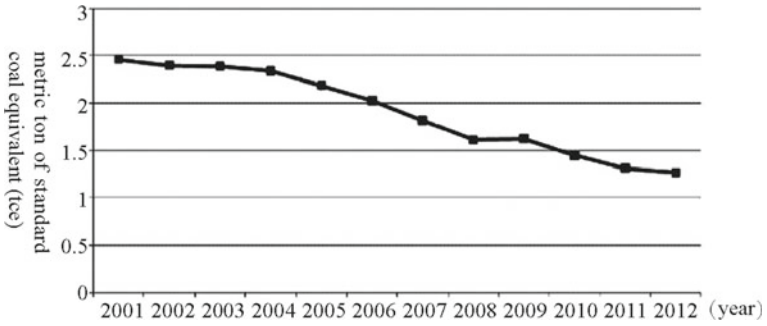

Fig. 6.3 China's energy consumption per unit of industrial added value (2001–2012)

6.3 Trade-off Between Industrial Development and Environmental Protection

In each country's industrialization, there is always a stage when the environmental problem stands out among all the issues. As discussed in the previous section, the relationship between industrial development and environmental protection is also a matter of weighing one against the other. Industrial production, a process of transforming physical forms of substances, is unlikely to have no impact on the environment. If changes to the environment brought by industry benefit mankind, it will be said to have "improved or beautified the environment"; but if they don't, it will be said to have "polluted or damaged the environment". It at least involves two basic problems: first, how to tell and evaluate whether changes to the environment brought by industrial activities benefit or harm humans, or to what extent it benefits or harms them, and who will benefit from these changes or who will be harmed by them? Second, if the goal of industrial development and that of environmental protection conflict with each other, which one should be prioritized? Who will prefer this one to the other? It shows that the relationship between industrial development and environmental quality is essentially a matter of weighing one against the other.

As early as the 18th century and the 19th century, environmental damages brought by industrialization in West Europe had already attracted a lot of attention and sharp criticism. In 1962, the book entitled *Silent Spring* by American writer Rachel Carson was published and caused serious concern among people with environmental damages brought by industrialization. On June 12, 1972, the United Nations Conference on the Human Environment was convened in Stockholm, in which member states of the United Nations endorsed *the Declaration of the United Nations Conference on the Human Environment* and undertook the great cause of global environmental protection. Since the mid and late 20th century, an increasingly number of countries have begun to adopt industrialization, leading to even heavier exploitation and use of natural resources and severe environmental destruction in the areas of industrial concentration. As a result, the contradiction between environmental protection and

industrial growth has been more and more strongly felt and the voice calling for resource conservation and environmental protection is getting increasingly louder.

Some people even believe that only "zero-growth" economy can have human economic activity (mainly industrial production) well controlled within the range that natural resources and the environment can tolerate. However, some advocate that China must abandon the traditional path of industrialization, that is to say, they believe that only if China abandons the developed countries' technical route of industrial growth that has been used for two to three centuries and finds a totally new way, such as adoption of an "in-between technology" (neither traditional technology nor advanced technology adopted by industrial countries), will it possibly deal with the serious challenge brought by resource and environmental problems successfully; otherwise the whole mankind couldn't survive on such a "flat, crowded and hot" global village eventually.

However loudly people called for zero-growth economy or a new way to achieve growth, the pace of global industrialization still stayed the same and could not be stopped. The crux of the matter is that market economy is the very economic system that promotes industrialization, but it is obvious that a laissez-faire economy cannot solve the contradiction between resources, environment and industrial growth spontaneously. Therefore, market economy also needs some help from the government. The regulation of resources and environment is one of the important means of government intervention. But the problem is that, according to the logic of economics, there must be a cost of regulation and those who are regulated (mainly enterprises) must pay such cost. So what influence will the cost of all regulation (including the costs transferred to corporations resulting from government regulation) have on industrial development and industrial enterprises? And further more, what influence will they have on the industrial competitiveness of each country? These issues have become an extremely important and controversial problem in the process of industrialization.

Just as mentioned above, industrialization is essentially a more efficient way of using natural resources in the technical sense. In the long history of mankind spanning thousands of years, the recent two to three hundred years is the greatest era of economic development and wealth creation, which is thereby called "the age of industrialization". Owing to industrialization, industrial societies have not only achieved rapid economic growth and the great accumulation of material wealth, but improved greatly people's living standard and social welfare. "Even the most well-off consumers in pre-Industrial Revolution society had virtually no goods at their disposal that had not been available in ancient Rome."[5] But since the Industrial Revolution, people's consumption level and quality of life have improved significantly, which is marked by the dramatic lengthening of human life expectancy. "Life expectancy was twenty-four in England between 1300 and 1425. It had probably been much the same in the Roman Empire. By 1801–26, the English level had reached forty-one. By 1999 it had reached seventy-seven."[6] In this sense, changes to the environment brought by industrialization are in general good for mankind. Based on the definition and the

[5] Baumol (2004).

[6] Wolf (2004a).

belief that "number tells", industrialization can be said to have "improved/beautified the environment".

The environment provides the condition for industrial development, and at the same time it is also the object of industrial transformation. Industrial production consumes natural resources and must be conducted in a certain environment. As there is a limit for environmental capacity, excessive industrial activities and huge emission of pollutants, be it gas, liquid or solid, will bring about environmental damages and even irreversible consequences. With the rapid progress of industrialization, especially in populous countries such as China and India, the negative impact of industry on the environment, especially environmental pollution and damage in the areas of industrial concentration is attracting more and more attention.

Just as some scholars pointed out, "Always in the past, there has been a conflict between industrial development and environmental preservation. If history is any guide, the ascent of the large third world populations to high living standards via the route of traditional industrialization would be an ecological nightmare. Recently the concept of *sustainable development* has been advanced as a solution to the conflict. Sustainable development is growth based on economic values that prioritize environmental quality and discourage such traditional hallmarks of industrialization as materialism, natural resource consumption, and high energy use. At present, sustainable development is an unpractical utopian concept." "Industrial activity is inevitably messy. The sum total of all this garden-variety pollution imposes a large burden on the world ecosystem."[7]

Thus it can be seen that the impact of industrialization on the environment is two-folded. First, industry intended in the first place to improve people's living standard, including environmental quality, and to build unlivable and even hard-to-reach places into the ones suitable for living and doing business. Therefore, a more developed industry leads to a better and more livable environment. It is true. As we can see, people tend to migrate to industrially advanced regions and countries. Second, industrial activity will also pollute and even damage severely the environment. In this sense, the environment is also a kind of resource that must be "consumed" in the industrial production. In some circumstances or when it exceeds the limit, the environment can also be like non-renewable resources.

We can observe that people would rather have the environment polluted to achieve industrial growth at a certain stage of industrial development; but after it moves onto a more advanced stage, the environment is much more valued, that is, people would rather scale down industrial production to protect the environment. In the process of industrialization, people have always been faced with the dilemma of choosing between industrial development and environmental protection, despite the fact that both are important and indispensable in the abstract.

A correspondent from *Global Times* wrote, "I attended the UN Climate Change Conference in Poznan, Poland. Inside the conference hall was a war of words raging; outside the hall, the Greenpeace Organization and local workers were also "crossing swords" with each other. At that time, Greenpeace was organizing some peaceful

[7] Steiner and Steiner (1994).

demonstrations nearby local coal mines, including writing slogans and flying banners, persuading local governments to close coal mines, to shut down fossil-fuel power station, and to use clean energy. Unexpectedly, their biggest resistance did not come from local police or coal mine security guards, but from local workers instead. The two sides confronted each other violently." This journalist commented, "All the people, rich or poor, should have liked cleanness and tidiness. But the use of new energy, whether it is wind power or solar energy, requires huge investment in equipment. So, here comes the problem: who should pay it? Greenpeace leader took the moral high ground and said, 'money is not important, the key is environmental protection'. Oh, he who doesn't run the house does not know the cost of fuel and rice at all! Rich people may think that money is not important, but poor people have to make good use of every penny. Greenpeace organization can raise a lot of funds from developed countries, but as for developing countries in which the issue of feeding people comes before anything else, I don't think any of them could say so confidently that money does not matter!"[8]

As a matter of fact, what we see most often is that poor people tended to leave unhesitatingly the countryside, which is however considered by urban people as "a good place to live", joining in the ranks of rural workers migrating to the industrial cities, which is far from being called "good places to live". They seem not to regret over their choice, which they think is quite rational. But as for rich people, they would rather leave the crowded and bustling cities and choose to live in the suburbs or even the countryside in order to enjoy the unpolluted air and water even if they have to pay higher traffic costs. It proves that in different stages of development, different groups view environmental quality differently. Thanks to industrialization, people's living standard has been improved a lot and thereby environmental quality has been increasingly valued. In this sense, we can say that it is industrialization that has turned environment into a more valuable "resource"; However, the environment would not be any cherished "resource" at all without industrialization, because the places with beautiful environment and fantastic scenery might be unlivable or even hard to reach due to remoteness or harsh geographical conditions.

If there were no industry, the most beautiful places on the earth must be the ones whose living conditions are unbearable or extremely tough; if a large population is concentrated in a place without any industrial basis, whatever beautiful environment will be reduced to a messy one. For example, without coal, petrol, electricity or gas, people would have to cut woods for burning fuel, and thereby green grassland and hills would eventually turn barren. So, it would be unlikely to keep a good environment. Seen from a long course of human's development, industrialization is essentially a fundamental way to solve resource and environmental problems. Without industrialization, the environment of our planet would inevitably get worse, which has been well proved by human history spanning several thousand years. So, industrialization is definitely not the villain for environmental degradation, but instead the only way to get mankind out of the environmental dilemma.

[8]Ren (2009).

Surely, the reality is not so "pure" as theory. In reality, it is not rare at all that people conducted industrial activity plundering natural resources in disregard of the environment. If such activity continues unchecked and humans don't have an environment-friendly concept of development, industrialization will probably bring about a great disaster. The only way to get out of the environmental plight caused by industrialization is to carry on industrialization relentlessly and efficiently and try to meet the environmental challenge by a developed industry on the one hand, and to discipline their own industrial behavior by using clean energy for industrial production in order to reduce its negative impact on the environment to the maximum on the other hand. China kept weighing up industrial development and environmental quality while advancing industrialization, and in the meantime, people's awareness about environmental protection has also increased from zero to a very high level.

Even though China can in general be called "a country with vast territory and rich natural resources", it is, in terms of land and resources per capita, actually a very barren country with huge environmental pressures. It is hard to strike a balance between the large-scale industrial production, which is conducted to support a large population, limited resources and environmental carrying capacity, so China must rely on its development to ensure environmental quality. However, such path will not be smooth and easy; rather, a huge price will have to be paid. In China, investment in environmental pollution control and industrial pollution control increases year by year in the process of industrialization; especially since the 21st century, investment in environmental governance has increased dramatically, due to the fact that environmental pollution has stood out among all other issues and the society has been a lot more concerned about environmental quality. In 2001, investment in environmental pollution control amounted to 110.67 billion Yuan; by 2014, it had reached 957.55 billion Yuan, which is 8 times more than that in 2001 (see Table 6.2).

More and more importance has also been attached to environmental protection in regional development. For example, in the period of the 13th Five-Year Plan and even

Table 6.2 environmental pollution control investment (in total) and industrial pollution control investment (completed) (unit: billion yuan)

Year	Total amount of environmental pollution control investment	Industrial pollution control investment (completed)	Year	Total amount of environmental pollution control investment	Industrial pollution control investment (completed)
2014	957.550	99.76511	2007	338.730	55.23909
2013	903.720	84.96647	2006	256.600	48.39485
2012	82.546	50.04573	2005	238.800	45.81909
2011	711.403	44.43610	2004	190.980	30.81061
2010	761.219	39.69768	2003	162.770	
2009	525.839	44.26207	2002	136.720	
2008	493.703	54.26404	2001	110.670	

Source National Bureau of Statistics database: national annual data

a much longer period, along with the "Belt and Road" initiative as part of China's international development strategy, China's main thrust of domestic economic strategy will be the coordinated development of Beijing-Tianjin-Hebei region and the development of Yangtze River Delta economic zone. The new thinking and new priorities established while China making the two regional development plans mark a new trend and unveil a new era of China's economic development.

While the state was planning on and making top-level design of the coordinated development of Beijing-Tianjin-Hebei region, National Development and Reform Commission (NDRC) first released the *Plan for Environmental Protection in the Coordinated Development of Beijing-Tianjin-Hebei region* on December 30, 2015, accentuating PM 2.5 control in Beijing-Tianjin-Hebei region as one of the major tasks. According to the plan, the annual mean concentration of PM2.5 in the Beijing-Tianjin-Hebei Region should be reduced to around 73 $\mu g/m^3$ by 2017, and approximately 64 $\mu g/m^3$ by 2020, down 40% or so from the level of 2013. "Moving non-core functions out of Beijing" has become one of the major tasks of the coordinated development of Beijing-Tianjin-Hebei region.

On March 25, 2016, the political bureau of the Communist Party of China convened a meeting and adopted a development plan for the Yangtze river economic belt, based on which the NDRC was expected to formulate *Yangtze River Delta's City Cluster Development Plan* and *Chengdu and Chongqing City Cluster Plan*. On January 5, 2016, President Xi Jinping ever pointed out in a seminar on the development of Yangtze river economic belt during his inspection tour of Chongqing, "In the current period or an even longer period, an overriding importance should be laid on the ecological repair in Yangtze river delta, which requires joint efforts on ecological protection and avoidance of heavy exploitation." This is the vital finishing touch added to the new thinking and new priorities of Yangtze river economic belt development.

As we can see, in these two major regional economic development strategies, priorities were mainly given to two major issues, namely, environmental problems and imbalanced development, such as issues associated with big cities and "excessive concentration of non-core functions in Beijing". That is to say, China has begun to pay particular attention to the possible negative influence brought by economic growth, especially industrialization; among all goals of development, ecological balance and environmental quality have become two top priorities. Such shift of priority is a great milestone signifying China's entry into a new stage of economic development.

As a matter of fact, industry essentially aims to turn useless things into useful ones, and harmful things into good ones. The industrial activity of turning good things, such as clean water, green hills, and blue sky, into harmful things like dirty water, barren mountain, and foggy days is a deviation from industrialization as well as an anti-rationality phenomenon going against the nature of industrialization, i.e., a greater tendency towards instrumentalism while seeking wealth. That is to say, in order to seek wealth, humans have used all possible means to plunder natural resources and descended into insanity without conscience and senses. So, what lies ahead for China is to stop such trend, to guide industrialization back to the rational path, and to govern

the way it is conducted, which constitutes China's current priorities of great historical significance.

Each country or region has possibly ever had "the Gilded Age" in the process of economic development, in which an excessive desire for material wealth might misguide the world so that humanity would pay no heed to natural environment, life safety and morality at all. But eventually mankind will awaken to such mistakes and realize that gild is not pure gold, which wealth will not necessarily lead to happiness, and that heavy unscrupulous exploitation of natural resources, a sheer betrayal of the nature of industrialization, will bring about irreversible damages to the natural environment and living environment shared by the whole mankind.

Surely, to protect the environment does not mean to abandon economic development; just to the opposite, a prosperous economy is an important condition underlying effective environmental protection. Poverty and backward technology cannot sustain a good environment. By comparing and analyzing the situations of different regions, we can easily see a high positive correlation between the level of economic development and environmental quality in general, which will be finally reflected in constant life expectancy prolongation and endless improvement of people's life quality. Each country's history has shown that if stagnation is the price that has to be paid for the environmental protection, such policy will hardly go anywhere. Therefore, regional development and environmental protection are two inseparable parts of industrialization, just like the two sides of a coin. Beijing-Tianjing-Hebei region and Yangtze river economic belt will be the first regions to reflect such objective law as well as the new thinking and new priorities of regional development in China.

6.4 Orientation of Government Policies on Resource and Environmental Regulation

Production and consumption of both fossil fuels and many industrial products will cause emission of pollutants or wastes and thereby pollution. If all the losses caused by pollution are also included in the cost of industrial enterprises along with consumption of factors of production, enterprises will have to pay all of them; on the other hand, since enterprises have covered all the cost, there wouldn't be any other problems requiring special attention. That is to say, if the resource costs and environmental costs are all covered by industrial enterprises, both consumption of fossil fuels and industrial pollution will not be special problems any more, because the market price mechanism can have all these problems solved. However, in reality, it is hard to achieve that. Almost all state governments have stepped into regulate the use of resources especially fossil fuels and environmental protection.

The major reasons are as follows: First, fossil fuels are non-clear energy that can affect the environment badly; in particular, emission of carbon dioxide would lead to "green gas effect" across the globe. Therefore, global collaboration is needed to regulate the use of fossil fuels. Second, pollution caused by industrial activity has

external diseconomy, and users of resources do not bear the full cost, and therefore, consumption of such resources must be limited and regulated so as to have external cost internalized. Third, the environment is a "public good", which can hardly be regulated by the price mechanism spontaneously.

The three reasons mentioned above can be boiled down to "market failure" in the end, so government intervention has proved very necessary. This is the general reason for resource and environmental regulation. It is usually considered that there are three major ways of government intervention. The first is command-and-control style, that is, the government decides what must be prohibited or limited; the second is through economic means, i.e., internalization of external diseconomies (external costs), such as a levy of tax on environmental pollution or fine; the third is through property rights, that is, to set clear boundaries for property to facilitate the functioning of market through property trading, such as carbon emission trading system.

The three ways of regulation have different theories behind them. As for the first one, government regulation on resources and environment falls into the "social" category rather than the economic one, and therefore, regulation objectives are mainly determined by social values rather than cost-benefit calculation. That is to say, economic benefit can and must be given up for the sake of environmental protection, which is the cost of social benefit. In practice, technology access standards and administrative approval are usually adopted, that is to say, plants failing to meet the standards or to be approved cannot go into operation, and whoever brings great damages to the environment will be given administrative or legal penalties.

The logic behind the second one is that the government helps to bring the role of market mechanism into full play, internalizing external costs caused by polluters and making them take responsibility for external non-economic consequences, i.e., environmental pollution. As far as the third type of government intervention is concerned, the government can "create" certain conditions and mechanism to facilitate the effectiveness of market economy and give clear property rights to "public goods", so that polluting behavior (mainly the emission of green house gas) which used to be non-tradable and have no price discovery mechanism will thereby have property boundaries just like private goods, i.e., "emission rights". As a result, they could be traded under a price discovery mechanism, and thereby "allocated" through market mechanism (emission trading system) in order to reach a satisfactory "equilibrium".

Judged by the logic of market economy, the third regulatory method is the ideal one, the second one is fairly plausible and applicable; as for the first one, the government has no alternative. But in reality, the first regulatory method has turned out to be the easiest way as well as a good method to establish responsibilities and interests for the regulatory body, and therefore, it tends to be the government's first choice when it comes to the matter of environmental regulation. The second one reflects market economy' principle of efficiency and accountability, that is, whoever pollutes the environment should pay for it, and whoever consumes natural resources should take the responsibility. However, the internalization of external costs might cause enterprises to burden more than they can bear, and they can hardly have any options. Besides, in such circumstance, the price discovery (cost determination) is usually administrative (or stipulated by laws), and therefore, it is very hard for enterprises to

take the responsibility and bear all the cost of pollution and consumption. The third one is smart, and in particular, it could give actors (enterprises) a list of choices and make the "public goods" (environment) tradable. And moreover, social goals such as resource conservation and environmental protection are usually achieved by low-level decision-makers (enterprises), being dissimilar from the second one, especially the first one that needs high-level regulatory decision-making to achieve these ends.

There are two opposing ideas on the government's selection of ways to regulate the environment. The first one holds that important goals especially those emphasizing social values should rely more on high-level decision-makers to ensure "correctness" and "location" and thereby the effectiveness of regulation. For example, important matters should be examined and approved by municipal governments, more important ones by provincial governments, and the most important ones by the central government. According to this logic, the more important or more serious the matters are, the higher the administrative level of the regulatory body should be: for example, the environmental protection department should be upgraded from vice-ministerial status to ministerial level; or those matters should be handed over to the regulatory body of higher level, for example, some projects who were previously supposed to be examined and approved by municipal or provincial governments should be handed over to the central government.

However, another idea holds that only the mechanism enabling low-level decision-makers (enterprises) to select independently can ensure the effectiveness of regulation, including the realization of social goals. Therefore, in terms of regulatory system, procedures of administrative examination and approval especially high-level ones should be reduced as much as possible. Generally speaking, the first idea is much preferred by Chinese culture, while western cultures especially British and American cultures are more inclined towards the second one. An immature market economy prefers the first one, while a mature one the second one. However, China kept switching from one mentality to the other while regulating the environment. Once major environmental pollution occurs, regulation would be handed over to a higher-level regulatory body; if less efficient regulation and too much red tape lead to the delay of decision-making, regulation of such matter would usually be transferred to a lower level, that is, the power of examination and approval would be delegated to lower levels.

No one questions the necessity of government regulation on environmental pollution, especially the victims of pollution would always ask the government to take big steps to regulate the environment and severely crack down on polluters. However, government regulation also has limitations. Effective regulation must meet some strict requirements, which are even harder to satisfy than effective market operation. When government regulation reaches the point where effectiveness is severely undermined, almost all the countries would choose to loosen control. Therefore, the reform on environmental regulation system seems to be an endless process. Sometimes, the reform is inclined to strengthen the government's regulation and control; but in other circumstances, the reform is inclined to loosen control or delegate the power of regulation. It is like a pendulum swinging back and forth. When it is too

left, the pendulum will swing back to the right, and then to the left, back and forth, seeming to have never found an "optimal" position in the between.

An effective government environmental regulation system needs to meet a basic condition, that is, the department in charge of regulation must have a neutral stand, which means that social interests should be its exclusive behavioral objective, no individual (departmental) interests being considered at all. In other words, the regulatory body of the government shouldn't have their own special interests; law enforcement officials must perform duties in conformity with the regulatory system; and all regulatory behaviors are purely for the sake of environmental protection to meet social expectations. Obviously, such condition is usually hard to meet completely. In reality, the government's regulatory enforcement department is always somewhat biased, which therefore would cause regulatory enforcement to deviate from the right path. So, it will be very hard to stop all corrupt practices in regulatory enforcement. This is also one of the major reasons why the regulatory system must be constantly improved and the public has always been calling for the deepening of reform on the government regulatory system.

The theories on environmental regulation system often postulate that regulatory policies will cover all targets (enterprises) indiscriminately. As a matter of fact, the reality is far away from this. Even in countries like China, which has a centralized government, environmental regulatory system and policies always vary a lot from region to region.

First, not only implementation regulations vary from region to region, but the intensity of law enforcement and discretion are also different. Even though environmental protection regulatory policies are unified by the central government, it is still possible that there is too much regulation in some regions and quite little in some. In view of these differences, enterprises tend to transfer from regions with strict regulation to those with rather loose regulation. As for enterprises with high-energy consumption and heavy pollution, regional regulation policies on environmental protection are usually an important factor to be considered before they settle in a certain region. Aside from regional variation, national variation in this regard is even more obvious, because environmental protection standards vary a lot from country to country.

Second, different types of enterprises need different environmental regulation. That is to say, for some enterprises, strong environmental regulation is needed; but for some, environmental regulation should be rather loose. For example, in some regions, higher environmental regulation standards are usually set for large enterprises, while lower standards small enterprises. Low-standard environmental regulation is actually a type of subsidy, whose amount is determined by the carrying capacity of the environment in the region.

Third, regulation measures are also different. Due to the government's regulatory capacity or other possible reasons, enterprises of the same region can hardly be regulated the same way. As a result, some are strictly regulated, while some are not punished the way it is supposed to be for their violation of regulations or rules. Such phenomenon could possibly lead to inequalities among enterprises and thereby undermine fair competition.

Differences in environmental regulation will lead to discrepancy between regions and enterprises in terms of competitiveness. As a result, people fear that regulation competition among regions, i.e., local protectionism, would possibly escalate into a race to the bottom on regulation. Low environmental standards might contribute to strong competitiveness of local industries and enterprises, so some local governments just turn a blind eye, consciously or unconsciously, to local enterprises' polluting behavior. But some scholar ever pointed out, "the evidence for such a race to the bottom in environmental regulation is lacking. Research shows that environmental regulations tended to tighten in developing countries, partly in response to political pressure. It is evident, in fact, that a polluted atmosphere and poisonous water are a rather substantial disadvantage if one wishes to attract multinational companies, since it will strongly discourage foreign professionals from living in the country." "In the high-income countries, too, there is no doubt that environmental standards have been racing to the top, not the bottom, over the last two or three decades. Local air and water quality have improved enormously, in response to tighter regulation."[9] The same is true of some Chinese regions. Local governments of these regions value environmental protection and improvement as a key to competition, striving to create an environment of higher quality; besides, it is also considered by quality enterprises as a positive means and strategy for development.

It touches upon a key issue, that is, how is environmental regulation related to industrial competitiveness? Are high environmental standards good for or harmful to industrial competitiveness? Statistical analysis shows that environmental regulation and industrial competitiveness are both on constant rise within a rather long period of time. Does it indicate some causal relationship between them? Our study shows that the "cleanness" of industrial production is being constantly improved in the process of China's industrial development. We are pretty sure that there is a positive long-term correlation between environmental protection and the improvement of industrial competitiveness. However, whether such relationship indicates a positive causal relationship deserves more attention.

There are two different views on the relationship between environmental regulation and industrial competitiveness. The first idea is, "If, in one country, environmental costs are 'internalized' by a tax regime that forces them to be reflected in the costs of enterprises, but those enterprises are forced to compete in a global market with enterprises in other countries that do not carry such environmental costs, the countries that require businesses to be environmentally accountable will be at a system disadvantage."[10] The same is true of regional competition.

Another view is just to the opposite. It is assumed that all enterprises of a country must pay taxes for pollution; and for the sake of simplification during analysis, it is also assumed that return on capital and the prices of all products are determined by global market. If so, their employees would be less paid; the more damages an enterprise brings about to the environment, the less its workers will be paid. But the problem is that workers with the same skills should get the same payment in

[9] Wolf (2004b).

[10] Ibid., p. 265.

the same country. So, the country's economic policies have to be adjusted after the levy of pollution tax, which will therefore bring about the following three changes. First, real wages of the country will fall to make up for the cost of environmental improvement; second, the country's businesses will use more technologies and facilities good for reduction of pollution; third, high-polluting businesses will decrease and move abroad. The last one is not as obvious as the former two. However, all these changes will not affect the country's competitiveness. Rather, pollution tax and regulation policies will yield good results as planned, i.e., mitigation of pollution, which will partly be achieved through industrial structural adjustment and partly through changes to technical features, so that the welfare of the people of the whole country will be improved. But a price has to be paid, that is, real wages relevant to products and services will fall. It is approximately the same at the regional level.

Our study shows that, the strengthening of environmental regulation in China didn't undermine the global competitiveness of China's manufacturing industry in general. At least, low environmental standards can hardly make any difference to China's industrial competitiveness after thirty years' rapid development. That is to say, aside from the fact that the improvement of global competitiveness of China's manufacturing industry concurred with the strengthening of environmental regulation (there is a positive correlation between them), China's manufacturing industry has already been capable enough to accept a higher environmental standard. And moreover, the improvement of environmental quality has even been considered an important way to enhance the competitiveness of manufacturing industry, which means there is indeed a positive causal relationship between global competitiveness and environmental regulation that can be felt by enterprises.

Even though there is a long-term positive correlation as well as an observable positive causal relationship between environmental regulation and industrial competitiveness as mentioned before, environmental regulation will still possibly increase the cost of enterprises in the short run. If regulation did not cause any cost to enterprises, there would be no need for regulation at all. If realization of the environmental regulation goal or even higher environmental standards could improve the competitiveness of enterprises automatically, these enterprises would try to realize it voluntarily, and thereby there would be no need for the government to step into regulate the environment, either. Therefore, at least government regulation in the short run will inevitably add to enterprises' internal costs. In order to survive, enterprises must be able to cover these costs and prevent their competitiveness from being heavily harmed. As for whether enterprises and the whole business concerned are able to cover the increased cost caused by environmental regulation in the short run, it is up to the competitiveness of the enterprise.

Generally speaking, though implementation of environmental regulation measures, such as raising environmental standards or increasing environmental tax, will burden enterprises with more costs, highly competitive ones can still be able to cover increased costs in the short run; and moreover, they will be even capable of adjusting technology and management as soon as possible to meet higher regulation requirements. If the raising of environmental standards can knock some incompetent competitors out, quality enterprises will thereby be relieved from pressures arising

from competitions with inferior ones. But in such circumstance, less competitive enterprises will hardly survive because they couldn't afford the increased costs. So, the strengthening of environmental regulation, especially the raising of environmental standards is a mandatory "cleansing" of industries and enterprises, which can ensure the survival of the fittest. It widely occurred across the country after China's entry into the mid- to late-stage industrialization.

In general, as for enterprises and businesses under fair competition, environmental regulation, which though increases their costs in the short run, can in the long run promote technical progress; the key is how to ensure a smooth transition from short-term cost to long-term benefit. That is to say, the increase in cost can be neither too high nor too low, otherwise many enterprises could not afford the high cost nor the incentive provided by regulation, i.e., long-term technical progress, would be too weak. In theory, appropriate environmental regulation should be both affordable and strong enough to pressure enterprises into improving technology. The key is to ensure regulatory uniformity as well as effective and fair competition.

Environmental regulation has an important bearing on the outcome of environmental goals, industrial and social bearing capability, and even the effectiveness and fairness of market competitions. Improper regulation might reduce excessively the number of market competitors, leading to de facto market monopoly and thereby affecting the effectiveness of market competition. Or too many small or weak market players (small enterprises) will be thereby knocked out, so that fairness of market competition will be undermined. In particular, if regulatory measures lack uniformity, that is to say, if enforcers have too much discretion over implementation of regulatory policies, just regulating easy targets and turning a blind eye to tougher ones, or if corruption in law enforcement ruins severely regulatory uniformity, the effectiveness and fairness of market competitions will definitely be severely undermined, too.

It should be noted that, for a rather long period of time, each region's obsession with GDP growth has led to not only environmental negligence but abnormal regulatory discrepancies between regions and thereby severe environmental pollution. First, due to lack of uniformity in environmental regulation, environmental goals cannot be realized. Enterprises failing to meet environmental standards tended to transfer from the regions with tough regulation to the ones with loose regulation. Second, a race to the bottom occurred. The enterprises that have meticulously fulfilled their environmental obligations tended to lose out to those that didn't implement regulatory policies strictly or not at all. The reason why the latter are so secured is that they have "behind-the-scenes backers". In this way, the former is not a "match" to the latter and the superior is thereby knocked out by the inferior. Third, implementation of environmental regulatory rules and policies has reduced to rent-seeking. Enterprises often bribed watchdogs for immunity; and watchdogs also sought unlawful profits by threatening enterprises, which explains why corruption is running so wild in the field of environmental regulation. Since the 18th National Congress of the Communist Party of China, China's efforts to beef up the anti-corruption campaign are very constructive to the cleansing of environmental regulation body as well as the improvement of the effectiveness of environmental regulatory system and policy implementation.

References

Baumol, W. J. (2004). *The free-market innovation machine: Analyzing the growth miracle of capitalism* (p. 3). Princeton University Press.

Guo, K. (2007). A view of China's water diversion on a global perspective. *South Reviews*, *347*.

Jin, B. (2005). China's industrial development under the binding of resource provincial and environment. *China Industrial Economics, 5,* 5–14.

Ren, J. M. (2009, January 7). Empathy is also needed in the movement of environmental. *Global Times*.

Steiner, J., & Steiner, S. (1994). *Business, government and society* (7th ed., pp. 427–428). McGraw-Hill Education.

Wolf, M. (2004a). *Why globalization works* (p. 43). Yale University Press.

Wolf, M. (2004b). *Why globalization works* (p. 192). Yale University Press.

Chapter 7
Regional Gradient Development: A Complicated Topic for a Giant Country

Regional differences and regional gradient development in terms of industrialization are a very unique phenomenon with "Chinese Characteristic". Despite the fact that major industrial countries also have the problem of unbalanced regional development, such pressure has been drastically reduced due to externalization. Spatial imbalance in most industrial countries refers mainly to national imbalance, such as the gap between European industrial countries and African countries in terms of economic development. However, the pressure of spatial imbalance in China cannot be externalized at all, which will inevitably lead to a severe imbalance in regional development. As a result, "two big gaps" will remain for rather long in the process of China's industrialization. One is the gap between China's level of economic development and the level of developed countries; the other is the gap between developed regions and underdeveloped regions within China. So, which gap should be closed first, in other words, which goal China should strive to achieve first, to catch up with developed countries or to achieve balanced regional development, is not only a critical matter of strategic choice, but a major issue concerning the relationship between efficiency and fairness that must be handled properly.

7.1 Inter-regional Economic Relations During Industrialization

Industrialization is a process in which all factors of production, namely, capital, land, labor and technology are combined in production. If factors are initially spatially separated, their combination in production will be achieved through spatial mobility. Some factors are mobile, while some aren't. Among those mobile factors, some have rather strong mobility while some rather weak. Regional competition in the process of industrialization is essentially a mechanism of attracting mobile factors, especially factors with strong mobility to the regions whose factors are not or less mobile. But

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against the backdrop of economic globalization, industrialization must be realized through global distribution of factors.

The spatial distribution of productivity and its future trend in China is as follows: the eastern region is relatively more developed, and thereby most likely to win global industrial competitions. By comparison, the central region and the western region are less developed. And therefore, the three economic belts came into being, namely, eastern, central and western regions. In the current international economic order, there are many barriers to free international labor movement, which means China cannot ship out cheap labor overseas in large quantities to have them combined with capital of developed countries; but instead, overseas capital can move into China, usually into the eastern region at first, being combined with cheap labor there. However, regional movement of labor within China is relatively easy, especially since the reform and opening up, labor migration from the west to the east has become increasingly easier. As a result, within China, a large percentage of western labor force migrates to the east and thereby combines with eastern capital as well as foreign capital flowing into East China. In this way, production capacity builds up very soon. In particular, labor that can move more freely is relatively of high quality, which is not only reflected in the easier movement of labor with higher qualifications in general, but the trend that people with higher overall qualities, who can better adjust to the market need, are much easier to move from region to region. As a result, these new migrants can find a foothold more easily and beat most competitors in labor market.

During China's acceleration of industrialization, the east took the lead in building a substantial amount of capital; most capital was as a matter of course re-invested in this region, while some was transferred to the west, just accounting for a relatively small part in the first place. But interestingly enough, though some eastern capital moved to the west in conformity with state policies, such as transfer payment, investment in China government bonds, policy-based lending of state-owned banks, a considerable part still ended up flowing back to the east through market channels, such as development projects in central and western regions undertaken by eastern enterprises, sale of products to the west, differences between deposit and loan in banks of central and western China.

In the meantime, with the development of labor market and the removal of barriers to regional labor movement (such as the loosening of "*hukou*" household registration system), labor, especially labor of higher quality in central and western China, has shown a stronger tendency to move to the eastern region, resulting in a great many people pouring into the east. In the east, there is a constant supply of labor, and for rather long, it can stop labor price especially the wages of "migrant workers" from rising. China's wage level was very stable from the 1980s through the beginning of the 21st century, which is more helpful to the eastern region's industrial development. Especially the eastern coastal regions such as Yangtse River Delta and Pearl River Delta have become a rare hub of processing and manufacturing industry in the world, whose comparative advantages and competitive advantages are both very outstanding.

Therefore, from the 1980s through the beginning of the 21st century, the gap between China's industry, (particularly in East China) and that of developed countries/regions was narrowed far more quickly than the gap between the industries of eastern, central and western China. As a matter of fact, the gap between the industries of eastern, central and western China even kept expanding instead of narrowing during this period of time. Such tendency did not change markedly until the beginning of the 21st century, especially the second decade of the 21st century. From then on, with the improvement of the eastern region's economic development and income level, the cost rate of some major factors of production, such as labor and land, began to rise first. However, by the time when industrialization enters the mid- to late-stage, some industries will have to move to central and western China and thereby their economy will keep growing at a higher rate than that of East China.

From the end of the 1990s to the beginning of the 21st century, the central committee proposed the "Western Development Program" as well as the "Rise of Central China Plan", aiming to speed up narrowing the gap between the three major regions of China as mentioned above. In June 1999, major Central Committee leaders said that the conditions for the acceleration of development in central and western China were already ripe and it was high time to take actions. In September 1999, the Fourth Plenary Session of the 15th Central Committee of the CPC suggested very clearly that China should implement the Western Development Program. Therefore, in November 1999, the central committee convened an economic meeting, putting forward that China should seize the golden opportunity and set out to implement the strategy of western development. In January 2000, the State Council Leading Group for Western Development convened a meeting to map out plans and strategic tasks for the acceleration of western development. In March 2001, the *Tenth Five-Year Plan for Economic and Social Development of the People's Republic of China* was adopted in the fourth session of the Ninth National People's Congress, in which more arrangements on the implementation of western development program were made. The overall plan on western development should be carried out in three steps: laying foundations, acceleration, and promoting modernization in an all-round way.

Western Development Program is intended to cover Chongqing (municipality), Sichuan province, Guizhou province, Yunnan province, the Tibetan Autonomous Region, Shanxi province, Gansu province, Qinghai province, the Ningxia Hui Autonomous Region, the Xinjiang Uyghur Autonomous Region, the Inner Mongolia Autonomous Region and the Guangxi Zhuang Autonomous Region, whose land adds up to 6.85 million square kilometer and accounts for 71.4% of China's territory. By the end of 2013, the population of this region totaled 366.37 million, accounting for 26.92% of the overall population of China; in 2013, GDP of this region was 12.600278 trillion RMB, accounting for 22.15% of China's GDP. Due to natural, historical and social reasons, the western region's economic development is rather lagged behind, whose GDP per capita is only 2/3 of China's average level and even less than 40% of that of eastern region. Therefore, it is a pressing task to speed up the reform and opening-up as well as the pace of modernization in Western China. Major measures of Western Development Program are as follows:

First, Western China is to accelerate infrastructure construction and mainly focus on highway construction. In addition, more efforts should be made to build railway, airport, major natural gas pipelines, power grid, communications, radio and TV stations and large and medium-sized cities' infrastructure. In the meantime, particular attention must be paid to the exploitation of water resources to ensure that they are rationally used and well conserved. Feasibility studies and first-phase preparations of key projects need to be soon conducted in order for infrastructure construction to start as soon as possible. Second, Western China is to take more concrete steps to construct and protect the environment. It should step up efforts to protect natural forests in the mid- and upper reaches of the Yangtze River and Yellow River, carrying out the "Grain for Green" program step by step in an organized way through steep-slope farming. Third, local governments should use their advantages in geography, climate, resources, etc. to develop vigorously businesses with their own characteristics and even high-tech industries if possible. Fourth, science, technology and education should be greatly promoted. Western China should speed up commercialization of research results, cultivate talent at all levels and of all types and strive to improve the overall quality of the workforce. Fifth, Western China should open further to the outside world, trying to enhance domestic investment environment and bring in more capital, technology and good management.

Shortly after the Western Development Program was put forward in the beginning of the 21st century, the central committee proposed and implemented the Rise of Central China Plan. Central China, including Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan provinces, is now China's major grain production base, energy and raw materials base, equipment manufacturing base as well as integrated transport hub ("three bases and one hub"). Central China accounts for 10.7% of China's land area, 28.1% of Chinese population, and 20% of China's GDP. On September 23, 2009, the State Council executive meeting discussed and adopted the plan to promote the rise of Central China. According to the plan, by 2015, central China's level of economic development will have increased markedly, and its status of being "three bases and one hub" will have been improved, too. Besides, the region will have witnessed a more dynamic economy, the capacity for sustainable development will have been constantly improved, new progress will have been made in the construction of a harmonious society, and per capita income growth rate of rural and urban residents will have exceeded 9% by then.

As part of China's industrial gradient development strategy, Western Development Program and the Rise of Central China Plan are an inevitable trend and thereby the right choices made by China in the circumstance. Due to the gap between eastern China and central and western China in terms of economic development, it is natural that social productive forces should be transferred from the eastern region to the central and western regions. However, central and western China is currently in strikingly different situation from the eastern region that was to accelerate industrialization at that time.

First, since the end of the 1970s, the eastern region has already begun to speed up economic growth, mainly relying on great expansion of traditional industries. As a result, China's overall economy and production capacity have already been

very huge. The economy in central and western China will suffer setbacks if it still relies on extensive growth: foreign demand increases slowly, domestic demand is rather low, most traditional industries are already very mature, and the market is approaching saturation. Therefore, industrialization in central and western China should not possibly rely solely on extensive growth.

Second, in the primary stage of industrialization, the eastern region, with superior natural endowments, yielded high agricultural output and thereby increased revenue, which was the very source of primitive accumulation of capital that laid the groundwork for regional industrialization. However, central and western China cannot gain high agricultural benefits from high output due to outstanding problems in the structure of agricultural production (low-end farm produce). If agricultural structure is not readjusted, rural people' income will probably not increase despite higher agricultural output; and moreover, an increase in output might even lead to more difficult financial situations.

Third, the eastern region's rapid industrial growth is mainly achieved through diffusion and imitation of common technology along with the supply of factors at low costs. Besides, the eastern region has a rather long history of manufacturing, and its commercial and cultural conditions are fairly conducive to the rapid shift from agriculture to industry especially manufacturing. However, in some areas of central and western China with a higher level of economic development, economic growth is mainly based on the exploitation of natural resources (such as coal), but their commercial and cultural conditions are still far away from satisfying the needs of manufacturing growth. When the cost of resource exploitation rises, central and western China's comparative advantages and terms of trade will deteriorate because of the monotonous industrial structure characterized by resource exploitation and primary processing of resources. Without economic benefits, expansion of processing capacity would lack financial support, and further upgrading would thereby run into some difficulties.

Fourth, while the eastern region was accelerating industrialization, China was still a shortage economy with great demand. Most industries were growing up, and thereby China could increase the supply in various industries to achieve economic growth. However, by the time when Central and western China began to accelerate industrialization, China was already a relatively surplus economy, and most traditional industries were already very mature, often resulting in overcapacity. Given the circumstances, most latecomers had to fight their way into the saturated market in order to seek opportunities for survival and expansion. As a result, market competition intensified and thereby created more pressure on the industrial development of central and western China.

Fifth, the eastern coastal region boasts favorable conditions for transportation and opening up, which facilitates the acceleration of industrialization. Though huge investment in infrastructure of Central and western China did improve the conditions of transportation and communications and make up for geographical disadvantages to some extent, high transport cost is after all something that could weaken the competitiveness of products made in central and western China. Especially as China further opens up to the outside world, the cost burden of Midwest products (especially

resources) resulting from geographical factors will become a problem that cannot be overlooked during their competition with foreign products.

Sixth, when the eastern region was accelerating industrialization, there was still high-level trade protectionism in domestic market. Some development zones could open up to the outside world through flexible (preferential) policies so that they could take part in global division of labor, while fledgling industries were highly protected. However, by the time when Central and western China began to accelerate industrialization, domestic market was already very open to the outside world, international competition was getting fiercer and fierce, the policy of trade protectionism had thereby become more and more impractical, and various industries were all "exposed to" global competitions.

To sum up, development and rise of Central and western China is in sharply different economic situation from the eastern region's industrialization acceleration. Despite many advantages, Central and western China faces more severe challenges, which determines that Central and western China has to find new ways to meet new circumstance. The key is that Central and western China has to use their own economic strengths to cultivate competitiveness. But the biggest problem is that traditional advantageous industries in Central and western China are mostly resource-based ones. In the primary stage of economic development, it is very necessary and natural that enterprises make good use of local resources, and thereby they all, consciously or unconsciously, began to take the path of resource-based industrialization, which however is seriously flawed. On the one hand, the cost of resource-based industries tends to increase gradually. These industries' cost advantage will gradually disappear when more and more resources are exploited; besides, resource-based products do not vary too much, and therefore it will be hard to improve economic benefits through technology (product) innovation when average profit is low. On the other, resource demand elasticity is low, price and currency risks of resource-based industries are high, and therefore, prices of products fluctuate wildly. Price fluctuation greatly influences industrial benefits and exchange rate movements influence both price and industrial benefits very greatly, too. As a result, resource-based industries tend to be unstable after their participation in global competitions; regions whose economic growth is highly dependent on resource exploitation will more often than not be badly affected by market fluctuations and volatile international markets.

The rationality of resource-based industrialization lies in the fact that it can fully reflect the principle of comparative advantage and give full play to the region's comparative advantages. Even though the effective use of local resources did lay the foundations for economic development, the level of economic development of a country or region does not correlate strongly with (natural) resource endowment in the long run. That is to say, countries or regions with an abundance of natural resources do not necessarily have a very high level of economic development, but countries or regions with fewer natural resources might have an economic boom. And moreover, the "resource curse" often occurs, which means abundant resources might have negative influence on economic development, hindering the development of manufacturing industry and thereby affecting the establishment of modern industrial civilization.

In order to cultivate the competitiveness of local industries and overcome their excessive dependence on resources as well as geographical disadvantages, Central and western China has been trying to make major strategic changes: orientation shifting from resource exploitation to market exploration, with deep processing serving as the main thrust of resource exploitation; industrial and product structure keeping adjusted to market needs and the changes so that Central and western China could receive industries relocated from the eastern region through innovative means. Owing to these strategic changes, a group of excellent enterprises emerged in central and western China, thereby creating many strongly competitive industrial clusters and growth poles. For instance, Chongqing, Chengdu, Wuhan, Zhengzhou, Changsha-Zhuzhou-Xiangtan city cluster (the first two being western cities, and the last three being in Central China) have all thereby become very famous and attracted a lot of attention in the process of industrialization.

Another prominent feature of China's industrialization in terms of inter-regional relationship is that regional competition provides strong impetus for economic growth. Inside a country, spatial transfer of labor is much easier than that from country to country, and the same is true of imitation and diffusion of technology. Therefore, regional competitions tend to cause "duplicate construction" and "industrial isomorphism", which are very prominent in the process of industrialization.

When market economy highly motivates production units and turns profits into strong stimulus for capacity expansion, some degree of overproduction will occur inevitably. So long as there is a market or profit margin for a certain product/service, enterprises will be strongly motivated to invest in it. As far as China's industrial structure is concerned, high-level production capacity usually co-exists with low-level one; besides, all regions want to speed up industrial development through imitation of technology. In such circumstance, an imperfect market mechanism can neither have resources allocated effectively nor ensure the survival of the fittest through benign competitions; and moreover, it might even lead to "reverse elimination", i.e., the phenomenon that "quality goods are even knocked out by goods of inferior quality".

Generally speaking, though enterprises in competitive industries, which run business legally under fair competition without causing severe external diseconomies such as environmental damage, waste of resources, infringement on labor rights and harm to security, might lead to some degree of "duplicate construction" and thus economic irrationality, it will be still unadvisable for the government to impose mandatory regulation through administrative means; rather, they should be regulated by market in order to achieve effective resource allocation through the survival of the fittest.

However, as for grave duplicate construction, i.e., unscrupulous ways of competition and severe external diseconomies such as environmental damage, waste of resources, infringement on labor rights, and even the improvement of duplicate construction capacity through illegal means, the government has to take strong administrative measures to standardize, restrict and even eliminate them. From the end of the 1990s to the beginning of the 21st century, in order to stop bad and even grave duplicate construction, overcome supply-demand imbalance, improve the industrial

structure, protect the environment, and ensure labor safety, the state ever took measures to restrict or limit the output of textile, metallurgical, coal, and glass industries and shut down five types of small industrial enterprises (namely, small coal mine, small oil refinery, small cement mill, small glass factory, and small thermal power plant), which has indeed overcome demand and supply imbalance in these industries to some extent.

But since 2001, plate glass, small coal pit, small ordinary steel, wire rod and textile industries have all seen a dramatic increase in output and investment, the rise of low-level duplicate construction and a resurgence of illegal mining. China repeatedly relapsed into duplicate construction and production overcapacity until the beginning of the 13th Five-Year Plan period. Given the worsening of situation, the central committee proposed to carry out "the supply-side structural reform", focusing on the tasks of "cutting overcapacity, reducing excess inventory, deleveraging, lowering costs and strengthening areas of weakness".

7.2 Industrialization Spreading to the Hinterland

The spatial pattern of industrialization is not only reflected in the shift of focus from the eastern region to the central and western regions, but the accelerated spread of industrialization from coastal areas to the vast area of hinterland. Areas where industrialization started and economic growth poles are mainly concentrated in urban agglomerations of the eastern coastal region since the reform and opening-up. Several industrial frontier regions with strong economic strength include Yangtze River Delta, Pearl River Delta and Bohai Economic Rim. Some central cities and economic zones in the inland region also developed very rapidly, but still lagged behind coastal regions in general. In particular, towns and counties are far behind central cities in terms of economic development. In towns and counties, agricultural production constitutes the bulk of economy, while industry and services are not developed, and the level of agricultural modernization is not high, either. The same is true of many towns and counties in the coastal region, which also lag far behind coastal cities in terms of economic development. For example, the northern region of Guangdong province in Pearl River Delta, northern Jiangsu in Yangtze River Delta, many rural areas in Bohai Economic Rim, and even towns and counties of Hebei province only several miles away from Beijing or Tianjin are all "less developed regions". Northeast China, the old industrial base, also has the same economic pattern in general: central cities are relatively developed while towns and counties are less developed.

The regional imbalance of industrialization in China leads to a huge gap between developed regions and less developed ones. Besides, there are also many less developed areas between developed regions. This is a typical phenomenon of China's "uncoordinated, unbalanced, and unsustainable" development, which determines that one of distinct spatial features of China's industrialization is its spread to the three major hinterlands of China, namely, coastal hinterland, inland hinterland, and county hinterland. Coastal hinterland refers to less developed areas in the eastern

coastal region; inland hinterland refers to the areas in central and western China; county hinterland refers to the vast rural area.

After over three decades' rapid industrialization, the spread of industrialization to the three major hinterlands in China is not only very necessary but basically feasible. First, China has already had very strong economic strength and technological capability, and its capital and human resources have increased significantly over the three decades. Second, infrastructure and geographical conditions of hinterlands have been greatly improved. Third, China has seen the rise of entrepreneurship as well as the great improvement of business management and risk tolerance. Fourth, as central cities are getting more mature, they tend to serve as growth poles radiating outwards into surrounding regions rather than the growth centers absorbing resources from elsewhere. For example, spread effects of Shanghai radiating outwards into surrounding areas and those of Yangtze River Delta into the middle reaches of Yangtze River are both improving; accordingly, absorption of resources declines relatively, too. A more rapid spread of economic dynamism from central cities will be more conducive to the acceleration of hinterlands' economic development.

The rather rapid spread of industrialization to the three major hinterlands has reflected the trend of China's economic development in the mid- to late-stage of industrialization, i.e., a shift towards multi-polarized, balanced, integrated and domestic demand-driven development.

First, in the primary stage of industrialization, China's economic growth was mainly driven by just a few first-tier cities in the coastal areas, which developed and got rich first. Compared with these first-tier cities, other regions including average cities were all relatively slow in economic development. However, these first-tier cities began to suffer over-crowdedness and economic slowdown after a period of rapid expansion. In view of this, only if China has more economic growth poles, its economy would keep growing at a fast and steady pace.

Second, incremental reforms and differential development are two major features of China's economic development, often leading to severe disequilibrium and many imbalanced and uncoordinated structures. So, industrialization must spread to the three major hinterlands in a fast and orderly way so as to improve their level of economic and social development significantly. Only thus will it be likely for China to achieve a relatively balanced economic growth.

Third, in each region, economic integration tends to cover more areas, including the intra-provincial integration of central cities with peripheral areas of these cities, inter-provincial cooperation and market integration, and urban-rural economic integration. Only the universal realization of regional economic integration can overcome protectionism and ensure economic "nationalization" in a real sense. Only if it is "nationalized" before being integrated into the "globalized" world economy will Chinese economy achieve sustainable development and avoid falling into the "middle-income trap".

At last, changes should be made to China's previous pattern of just opening central cities up to the outside world in contrast with hinterlands being relatively closed. Only if China opens up fully to the outside world including the three major hinterlands will it achieve the goal of macroeconomic structural transformation,

whose main thrust is domestic demand expansion. Currently, one major reason for China's lack of domestic demand (mainly domestic consumption) is that the economy of hinterlands is relatively closed while the first-tier central cities are highly open, resulting in coastal central cities being more closely linked with world economy than with domestic hinterlands. In consequence, China's huge production capacity is detached from the small market of hinterlands, which has thereby resulted in imbalanced development. Therefore, only when hinterlands are fully open to both domestic and foreign markets, will a better groundwork be laid for domestic demand growth.

In the past, people often thought that geographical conditions of coastal areas are more favorable to economic development while those of inland hinterlands hindered their economic development. In order to account for the industrialization gap between countries, some people also put the blame on geographical differences, concluding that coastal regions are more developed while inlands are comparatively backward. However, it is not entirely true. With an overview of all countries' industrialization history and the current world economic map, we can observe very easily many cases of inland countries' industrialization success despite the fact that coastal countries and regions did benefit a lot from their geographical conditions. Swiss, Luxemburg, and Austria are the most typical inland countries of this type, which all have a very high level of economic development and are even admired by many coastal countries. Germany is also another good example, which has many well-known developed inland regions such as Frankfurt Am Main and the Ruhr district. Some of these inland countries and regions benefit from abundant natural resources, some serve as the hub of regional or international communications, and some have overcome geographical disadvantages through infrastructure construction and established highly competitive real industries. All in all, inland hinterlands, instead of being blocked from the "sunlight" of industrialization, also showed great promise and even laid a very solid foundation for real economy.

China's industrialization is also characterized by the hinterlands' strong momentum of growth. Having entered the 21st Century, some hinterlands already saw a higher economic growth rate than coastal central cities that used to be major growth poles over the past 30 years, which means the widening trend of the gap between regions in terms of economic development has been almost reversed. China's economic map now witnesses an upward trend in the proportion of hinterlands (relative to coastal central cities).

First, after central cities radiate outwards into more surrounding regions, many industries begin to transfer to coastal hinterlands, and some high-end industries are also moving to the peripheral areas of central cities and surrounding provinces. Within some coastal regions whose level of economic development varies from place to place (such as Guangdong province), industries are being transferred from central cities to less developed farther places (such as northern Guangdong) rather quickly. A very obvious phenomenon is that many provinces and cities had been trying very hard in the past to achieve economic integration through inter-provincial (city) cooperation (through administrative means) but to no avail; while at present, the pace of closer inter-regional integration is speeding up, which suggests that there are good prospects

for them achieving the goal of regional economic integration (e.g., Yangtze River Delta) that they have been desiring for for long.

Second, inland hinterlands are growing at a higher speed than coastal areas, and in particular, significant progress has been made in the implementation of Western Development Program and the Rise of Central China Plan. In central and western China, several large central cities and city clusters are emerging; resource exploitation and manufacturing industry are expanding rapidly; urban-rural integration and the program of building a resource-conserving and environment-friendly society are becoming distinctive economic features of central and western China.

Third, county economy is becoming increasingly dynamic, and industrial parks have in particular become a major pillar of county's economic development. Spatial advantage of county economy is becoming more and more obvious, and the combination of industrialization with modern agriculture and services is also another unique advantage of county economy.

Geographical, resource and ecological conditions vary from hinterland to hinterland, whose development patterns are not identical but do have something in common.

First, all hinterlands attach great importance to infrastructure construction, being committed to improving material conditions for opening-up and inter-regional communication, overcoming geographical disadvantages through rather complete infrastructure, and cultivating industrial clusters with strong global competitiveness.

Second, all hinterlands value scientific planning very much, having formulated development strategies with farsightedness and built competitive industrial chains and areas of industrial concentration to meet local conditions and needs.

Third, hinterlands highlight urban-rural coordination, construction of city clusters, and the economic integration of contiguous regions with a view to breaking urban-rural segmentation, inter-urban barriers and mutual blockage between neighboring regions. In particular, local governments actively push for a coordinated and integrated development pattern and avoid being the villain, i.e., the very administrative factor causing segmentation and blockage between regions.

Fourth, hinterlands seek to encourage innovations and invigorate the private sector. As hinterlands are rather closed and have unfavorable conditions for communications, local people's way of thinking has been thereby greatly affected, that is, people lack innovative thinking and open mind, resulting in the private sector lacking dynamism. But many hinterlands have learnt from past experiences and committed themselves to invigorating the society through innovation, enterprise and opening-up.

Fifth, hinterlands all take very seriously the handling of the relationship between industrial competitiveness, environmental protection, and people's livelihood and welfare. After all, the spread of industrialization needs to be supported by competitive industries, which will inevitably do some harm to local environment; but in the meantime, industrialization must aim to improve people's livelihood as well. So, here comes the problem: improvement of people's livelihood (including the improvement of wage level and social welfare), industrial competitiveness and environmental protection are both interdependent and somewhat contradictory. To handle their relationship properly and to make them benefit from and complement each other is the

strategic issue of critical importance to the long-term sustainable development of hinterland economy.

7.3 The "New Normal" of Regional Economic Development

As China's industrialization moves into the new phase of development in the second decade of the 21st century, its economy begins to enter the "new normal", and regional economic development also begins to display such features. The rise of China, an extremely important global player with one fifth of the world population, has already entered a critical stage, that is, China's level of development has already exceeded the world "average". From then on, China in general will still continue to "catch up" with developed countries; in the meantime, some regions are approaching and even have already reached the level of developed countries or regions. Most importantly, after years of arduous efforts, China, whose economy had been below the world average for over 200 years, is now approaching it; and moreover, a succession of regions has already exceeded it. Take the example of coastal provinces, which developed and prospered first, their per capita output and income have already exceeded the world average level and are even approaching the high income level. It is just like a very big architectural project, which is completing "plus-minus zero" and entering a new phase of construction. From that point on, great changes would take place and attract more attention from the world. The basic trend of China's regional economic development is profoundly changing, and its strategic potential for growth will change significantly, too; but in the meantime, problems that China is to meet up with would be more complex and profound.

The "normal" change of China's economic development will inevitably be reflected very prominently in the regional economic development. As far as the trend of economic growth is concerned, among 31 provincial areas, only Tibet reached the goal of GDP growth in 2014, while other regions all failed. The GDP growth rate of Shanxi province, Heilongjiang province, Liaoning province and Yunnan province was 3% lower than the expected level. In view of that, all provinces, autonomous regions, and municipality cities except Tibet lowered their goal of GDP growth rate in 2015, and Shanghai even didn't set a goal for it. It shows, on the one hand, that China's economy has indeed shifted from high-speed growth to mid-high-speed growth, and that the economic growth rate of each region is expected to decline by 2–3%. On the other, it also suggests that each region is quite at a loss in the New Normal of economic development. As industrialization deepens, many factors deciding the potential growth rate also change dramatically, and so does the order of priority in social values, that is, the balance of social values have shifted to moderate materialism.

Therefore, GDP growth rate is not the only and the most important goal like before, and "Development is of overriding importance" is not interpreted simply as "Only GDP matters" any more. But it does not mean that, under the New Normal, the economic growth rate or GDP is not important at all or even should be cursed. As

a matter of fact, GDP, in the statistical sense, is still an irreplaceable macroeconomic indicator. All aspects of economy, such as employment, finance, debt, trade, price level, supply and demand and prices of staple commodities, are all related to GDP growth directly or indirectly. It can be said that a region cannot be too obsessed with GDP growth rate, but its economic development cannot do without it, either.

China is now approaching and even exceeding the world average level of GDP per capita, and is still in general in the era of industrialization characterized by creation and accumulation of material wealth. Some regions might have already entered the late stage of industrialization or even "the post-industrial age", while most regions still need to deepen industrialization; besides, some regions are just in the middle or even primary stage of industrialization. Therefore, on the whole, China is still catching up with developed countries in terms of economic development.

After all, the era of ultra materialism characterized by cutthroat competition and disregard for the environment as well as people's livelihood and welfare has already ended. Now, the social psychology is shifting towards long-term rationality, public thinking and enduring patience; the strategic thinking of national development is switching to farsightedness, long-term goals and stability of the country. So, the strategic thinking of regional development must also adjust to the new normal in the new era.

Entering the new era, China's regional economy will display new features. The future economic development will not be mainly propelled by government stimuli, but instead, it will be driven by a more effective and dynamic market mechanism so as to achieve innovation-driven development. Each region must consider whether a particular business will be of value to their own region before making decisions, and avoid irrational thinking as in "cut-throat competition" or "killing the goose that lays the golden egg"; rather, they must respect local people's interests and wishes. Biased, differential, administrative regional economic policies are changing for more open, unified and fair ones, which is actually the result of values shifting from ultra materialism to moderate materialism.

But the problem is that, regions also tend to compete with each other even in the market system that ensures fair competition. If regions do not mainly compete for GDP growth, if they do not mainly rely on low-cost resources to win competitions at the expense of environment, if their competitions are not mainly propelled by preferential policies or government subsidies, where will the strategic focus of regional development be shifted? If regions must weigh one goal against another and choose one from many strategic goals, they need to know how big strategic space there will be in seeking a particular goal.

Having conducted some research, the head of a government policy research institute in a developed coastal province found out that this province would lose out and pay a huge price if it continued to compete with other regions for GDP growth. Therefore, new strategic goals for regional competition should be set. He proposed that "blue sky, green water and high income" should be the major target for the province, that is to say, it should seek to establish a leading industrial structure ensuring fresher air, safer water sources and higher income. If such goal is satisfying, is it also feasible? If it is feasible for relatively developed regions, will it also work for other

regions? It can be observed that unique strategies have been made to suit their own economic development in some regions, and some even aim to build themselves into "ecological city" and "slow city". The feasibility of such non-industrialization strategy should be determined by the changes in the strategic space of each region, i.e., whether each region's strategic leeway in economic development could be big enough to support their shift of values to moderate materialism.

With the rapid economic growth, China's strategic space for economic development is also changing very fast. The so-called "strategic space" refers to the scope of economic activity and economic agents' behavior as well as the relevant construct of resource interests. As far as regional economic development is concerned, its strategic space involves factor, technology, culture, geopolitics, etc. Since the 1980s, China's ultra-materialism-driven industrialization has on the one hand greatly expanded and changed the strategic space for regional economic development, but on the other, it has also led to "spatial crowdedness" and "spatial narrowness" in some respects. The so-called "spatial crowdedness" refers to too much pressure on space bearing capacity caused by excessive concentration of economic activity and intensity of economic behavior; "spatial narrowness" refers to constraints on economic activity and behavior of economic agents preventing them from expanding in both depth and width. As far as the changes of strategic space for China's regional economic development are concerned, at least the following aspects deserve particular attention.

First, space for resources. For over thirty years, China's high-speed economic growth has been fuelled by massive resource input under the mentalities of "Letting Water Flow Rapidly" and "Making good use of what is near at hand". All regions set out to make use of local resources to expand resource space and stimulate their economic growth. Mining, development of land, and construction boom such as building houses and development zones did create huge production capacity and change the look of cities, towns and counties radically and rapidly. But in the meantime, it also resulted in spatial crowdedness, which can be typically seen from the deteriorating environment, traffic congestion in cities and water shortage.

In sharp contrast, there is also an increasing number of places being in the opposite situation, such as energy supply exceeding demand, housing vacancies, and difficulties in attracting investment in development zones. In these regions, "under-population" has become a very prominent problem. Compared with city plans on the future population, China is now having a large shortfall in the population. China seems to have become a country where people are "in short supply". In some regions, such as the Northeast and many small and medium-sized cities, "under-population" has become a constraint on regional development, and such effect has already been greatly felt there. In order to meet the population target, some regions (cities) have to expand their scope of jurisdiction and merge with surrounding cities and counties; or some county-level cities and counties will be incorporated into a larger city and thereby become a new "district" of this city. The phenomenon that China has so many "big cities" with a large population does reflect the reality of population agglomeration; besides, it is also the result of more surrounding areas being incorporated into a "larger city", which is to a large extent a statistical illusion. It shows that the density of economic activity in these regions does not correspond with the huge

and rapid resource input, that is to say, these regions are not appealing enough. Massive exploitation and input of mineral resources, land resources, and environmental resources has as a matter of fact undermined the advantageous spatial structure of resources. Resource advantages have as a result been reduced to economic weaknesses. For example, in Shanxi province, which is blessed with large coal reserves, and in Northeast China, home of resource-intensive industries, the economy is rather sluggish.

As a matter of fact, these problems concerning resource space manifest themselves directly in the narrowness of "profit space" in economic activity, that is, huge input of resources did create "one-off" huge profits, which however cannot translate into sustained "profit space" in economic activity. Some regions were thereby put on a curse and businesses yielded fewer profits than expected. One of the key solutions is to strengthen effective resource space, i.e., to cultivate sustained "profit space" and "convenience space" of economic activity.[1] A less-dense-economic-activity-oriented regional development strategy is not entirely impossible, but, given China's actual national conditions, the relationship between natural environment, humanized environment and human activity density must reach a certain level to ensure enough profit space and convenience space necessary for sustainable regional economic development.

Second, space for industrial technology. One of the major reasons for each region's failure to create bigger strategic space for economic development, especially effective profit space is that businesses' expansion of technology space is rather lagged behind. The author of this book ever wrote an article on China's path of industrial development, i.e., "horizontal" industrialization. That is to say, enterprises tended to enter and expand rapidly industries with huge market space by making imitative technical innovations at a horizontal level through low-cost alternatives, churning out products with better price-performance ratio and thereby seizing large market share.

If judged by the size or scale of business, the so-called "success" will usually be easily made in the short run. However, such technical path tended to result in the narrowness of technology space, low diversity, very high substitutability of Chinese industries and products, and thereby the spectacular commercial achievements made in the short term would soon translate into very low or even zero profit. The current severe problem of "overcapacity" actually results from the narrowness of technology space. Entrepreneurs seem to have been caught up in a curse, for whatever they produce always ends up with overproduction, so they are too confused to know what business they should invest in next. In such circumstance, they must strive to further develop their technology, adopt a multi-dimensional industrialization path, and upgrade industrial technology in an all-round and multi-level manner. Only thus can the strategic space for regional economic development be greatly broadened. Moreover, technological progress should not just aim for "wealth accumulation", but more for "green, clean, sophisticated and sustainable" products. Only thus will industrial technology space as well as the strategic space for regional economic development be

[1] Jin (2015).

greatly broadened. As a result, each region will not see many enterprises competing against each other on the same technological level any more, but instead, they will showcase their capabilities on many technological levels.

Third, space for local culture. Seen from the history and current situation of each country's industrialization, each country or region's strategic space for economic development is deeply influenced by local culture. For example, even in the United States, a strongly innovative country, the innovation model of "Silicon Valley" can hardly be copied in other regions. Whether an industry can take root in a region and remain competitive is deeply influenced by the region's cultural pattern in the long run. In the modern world, due to the openness and globalization of industrialization, each region's industrial culture is usually a mixture of "globalized culture", "local culture" and "migrant culture". That is to say, modern industrial civilization does not only have global and western features, but local features.

As industrialization moves further forward, the influence by local culture will probably be more and more strongly felt. It can be observed that in both early and middle stage of industrialization, each country's industrialization appeared to be quite similar (called by some economist the "standard" industrial structure in the process of industrialization); however, after their entry into the late stage, each country tended to take different paths. As each country or region has their own unique features, industrial civilization is also divided into different categories by local features, including mining civilization, trade civilization, real estate civilization, manufacturing civilization, and financial civilization, among which manufacturing civilization is of decisive importance.

Even though all countries and regions might fall into the category of "manufacturing civilization", they also display different features due to different industrial cultures, for example, many Chinese regions also display strong features of "real estate civilization". "Manufacturing civilization" values imitation tends to produce popular and good-quality goods at cheap prices, and entrepreneurs just focus on material pursuit. As a result, large quantity, better price-performance ratio and small profits but quick turnovers have given Chinese products a cutting edge. But such civilization also has weaknesses, that is, space for industrial culture is narrower, products lacks cultural characteristics, and added values are lower. The fact that Chinese consumers do not have very high cultural tastes and focus more on material functions of products is also one of the reasons affecting Chinese industries' and products' culture space. Surely, the abovementioned is just in the abstract. As a matter of fact, China's industrial culture varies sharply from region to region. For example, as for regions belonging to mining civilization and regions belonging to manufacturing civilization, both having unique cultural features, they should make best use of their strengths and avoid weaknesses to give full play to their own advantages. However, these regions are also bothered by the same problem, that is, each region's space for industrial culture does have wide and deep influence on their space for industrial technology in the long run. In view of this, each region has to establish their unique industrial culture and try to overcome cultural weakness in order to expand the strategic space for regional economic development.

Fourth, geostrategic space. Each region's development, including the evolution of local resource space, space for industrial technology and space for local culture, occurs along with the changes of geographical relations as well as political and economic relations in the long run. Seen from the history, each Chinese region's development has been influenced by its then geopolitical landscape and the changing process. China had ever remained the world economic "center" for thousands of years, but since modern times when western "sea powers" started the Industrialization Revolution, Atlantic maritime powers have thereby become the core countries, while other nations turn into "periphery" or "marginal" countries.

In such era of sea power, China's economic map is accordingly divided into three major parts, namely, East China, Central China, and Western China, in descending order of the level of economic development. Currently, the world geo-economic and geopolitical landscape is changing profoundly. The rapid development of transportation engineering technology (such as high-speed railway, highway, and aerospace) and electronic communication technology (such as internet, mobile communications, and satellite), Eurasian interconnection and the opening of new maritime routes will greatly change the global geo-political landscape as well as the trend of world economic development. In order to adapt to and even lead such great global trend, China recently proposed the Belt and Road initiative (the Silk Road Economic Belt and the 21st-century Maritime Silk Road) . With the Pacific Ocean lying to the east of China, the center of Eurasian continent to the west, the Indian Ocean to the south, and Mongolia and Russia to the north, China is blessed with favorable conditions for both mainland economy and marine economy.

Saul Bernard Cohen pointed out, "Of significant geopolitical importance is the fact that China has both maritime and continental orientation." China's rapid development will give rise to a third global geostrategic realm, i.e., "mixed Continental-Maritime East Asia".[2] As a result, with the dramatic change of global geographical relations, the strategic space for the economic development of eastern, central and western China will change drastically, too: regions that used to have poor traffic network might become the "main artery"; outlying regions might become the "international gateway"; inland regions might become the "frontiers for opening-up"; eastern coastal regions might become the "rear base" for 3-million-square-kilometer sea area. All in all, each region will possibly get more strategic space from the establishment of a new geographical landscape characterized by new "point, line, belt, region and network" in China and neighboring economies, but the most important matter is whether a new strategic thinking for regional economic development can be formed in the New Normal.

To sum up, when China enters the New Normal of economic development, i.e., the new stage of industrialization, with social values switching from "ultra materialism" to "moderate materialism", strategic thinking and policy goals for regional economic development will thereby have to adjust to such change, too. Due to the narrowness of strategic space, "horizontal" industrialization with narrower resource space has

[2]Kohen (2008).

now run into difficulties: a reduction in resource marginal efficiency, overcapacity in processing, shrinking profit space, regions being unappealing, environmental bottleneck, and a downward trend in the economic growth rate.

Therefore, each region must expand their strategic space for economic development vertically in terms of resources, industrial technology, local culture and geographical landscape. Such expansion mustn't copy the previous horizontal pattern or mentality valuing short-term and quick outcome. That is to say, instead of pursuing short-term goals, promoting horizontal growth and seeking quick results, each region should develop strategic thinking, i.e., long-term vision, long-term goals and long-term stability, striving to adapt to the new pattern of economic development and lead the trend in New Normal with long-term rationality, public thinking and enduring patience.

7.4 Changes in the Orientation of Regional Economic Development Policies

Since the 18th National Congress of the CPC in 2012, the new Central Committee has taken sharply different approaches to economic problems, stating clearly that the central government would not adopt strong incentives to carry out macroeconomic interventions unless the situation is beyond tolerance, but instead it would strive for in-depth reforms and reduce government intervention to unleash microeconomic dynamism. Besides, it also emphasized that market should play a decisive role in resource allocation under fair competition.

That is to say, future industrial development will not mainly rely on government intervention, i.e., stimuli, but instead it should be more driven by market dynamism. It means a shift in the orientation of regional economic policy: regional economic development will not be mainly propelled by "preferential treatment" and special policies like before, but instead, local governments will strive to break regional barriers, reduce discriminatory policies, increase openness between regions, create a unitary and open market and thereby ensure fair completion in a wider area. If "special economic zone" was the signature economic policy in the past, the future one will be "free trade zone". As far as "special economic zone" is concerned, it means the policies that are practiced in special economic zones will not work in other regions, that is to say, special treatment just applies to special regions or parks; as for "free trade zone", it means "whatever is practiced in free trade zones can also apply to other regions", that is to say, these polices can "be both promoted and copied". In other words, each region's development will not be stimulated by discriminatory policies or preferential treatment any more, but mainly driven by fair competition in a unified and open market instead. Therefore, all businesses, being offered no policy "short-cuts" ("preferential policies"), have to rely on innovation! Such innovation must be indigenous technological innovation driven by internal factors, rather than innovation incentivized by carrots or external factors.

One of the typical phenomena reflecting such change in the orientation of regional economic policy is the upward trend in the expansion of regional economic integration: intra-provincial economic integration (including cities and counties within the province) will occur; in particular, inter-provincial economic integration will be greatly strengthened. For example, larger areas such as Yangtze River Delta, Pearl River Delta and Beijing-Tianjin-Hebei region will become more and more important regions ensuring integrated resource allocation and industrial innovation coordination. Besides, larger economic belts, such as Yangtze River economic belt and Silk Road economic belt will be formed, too. "Because in global market, survival of any global player depends on it exploiting all the advantages offered by the cluster(s) in which it is located. Location becomes even more important for that reason." Such importance is also reflected in the fact that "falling costs of transport and communication lead to more concentration of business in clusters"[3]. That is to say, the widening of regional economic integration will be very constructive to optimizing the spatial pattern of China's industrial development.

Therefore, the dynamic mechanism of regional development and the spatial structure of industrial development will both change in the new era of development. The previous dynamic mechanism characterized by "the supply of resources at low prices" and "preferential policies as incentives" will be put to an end. In some sense, China can be said to be undergoing a transition, in terms of region development, from the era of "special policies" to the era of "free trade". In the era of "special policies", each region sought to establish "zones of special policies": there were not only officially-named "special economic zones", but numerous policies specially designed for special zones ("*can zhao te qu zheng ce*") and some "even more special policies" designed for industrial parks. All in all, economic development in such era was driven by "preferential treatment" and "discriminatory policies". However, as for the era of "free trade", each region seeks to integrate into a wider network through regional economic integration characterized by opening-up, fair competition and well-organized cooperation, and then into national economy and even into global economy reflecting the principle of free trade. All in all, economic development in such era is driven by "fairness" and "openness".

As China is a developing country, its industrial development, spatially speaking, is usually a process of relocating, taking root and upgrading (or another round of relocation), which is determined by a region's attractiveness, carrying capacity, absorption of industries and support for industrial development.

Though not having industries as advanced as foreign countries or other regions, developing countries can attract industries from them and have these industries relocated, which is usually reflected in the real economic world as the volume of investment they attracted. If a lot of enterprises want to enter the region, the carrying capacity of the region will have a decisive influence, including resource carrying capacity, land carrying capacity, environmental carrying capacity and infrastructure. The larger the carrying capacity of the region is, the more enterprises will possibly be attracted to the region and thus form industrial clusters.

[3] Swann (2014).

With the gradual formation of industrial clusters, the absorption of external industries into local industries has become more and more important, which therefore determines whether the industry can locate in the region for long. If the region fails to accommodate external industries, the enterprises that moved from other regions or countries will probably become "enclaves" and thereby fail to integrate with local economy and society. Therefore, these enterprises would not be of too much help to local economic development except the fact that they serve as "taxpayers" during their short stay. Once other regions appear to be more attractive, they will definitely move out of the region. As a result, this region will have to attract other enterprises or industries.

If a region wants to retain an industry, it must provide strong support for the industry, supplying the industry with good conditions and great prospects for constant upgrading, including satisfying supporting services, living environment and local culture good for industrial technology innovation, especially indigenous technological innovation. Therefore, whether a region can well support industrial upgrading and innovation has a decisive influence on the long-term prosperity of regional industries.

Generally speaking, in the process of industrialization, regional industrial development is determined by three key elements, namely, comparative cost, the level of technology, and culture. In the primary stage of industrialization, the first element, i.e., factor abundance and cost (price), matters the important; in the mid-and late-stage, the second element, i.e., technological resources and technological innovation, is becoming more and more important; but in the long run, the third element, i.e., local culture (organizational culture and social culture) is determinant. It can be observed that in the primary and middle phase of industrialization, each country's industrial development appeared to be the same, but each country tended to take totally different paths of industrial development in the late stage of industrialization. There is a "standard" pattern for economic development, but none for culture, which is diversified. When local culture is playing a more and more decisive role, industrial development of each country or region begins to take different paths and develop their own styles.

The long-term logic behind regional industrialization is that aside from location and resource features which played very important roles in the primary and middle stages of industrialization, scientific and technological innovation and culture are another two decisive factors, with different influences on industrial development. For instance, science and technology determines the function of products as well as productivity, and therefore product function keeps improving but their price keeps falling; as for the influence of culture that is related to art and determines the taste of products, products are beginning to have more and more styles of their own, higher and higher level of market segmentation and increasingly larger added values under the influence of local culture, and thereby their price remains rather high. It suggests that on the one hand, each region's economy will integrate with global economy, but on the other, each region should keep and develop local industries with unique styles, especially quality industries with unique cultural characteristics. In a certain sense, fine industrial products are just like "works of art"; the finest manufacturing industry usually has very deep culture which can hardly be copied or imitated.

Therefore, in order to solidify the regional foundation for industrial development, each region must cultivate and enhance their attractiveness, carrying capacity, absorption of industries and support for industrial development. Industrial science and technology and industrial culture are the two wings added to regional economic development, enabling Chinese industries to shift gears and achieve full transformation. The crux of the matter concerning the global competitiveness of Chinese industries is whether Chinese regions can provide good conditions for technological innovation and cultural support for businesses, especially quality enterprises with leading technologies to locate.

When it comes to the regional industrial development, the relationship between industrial development and regional development is also an important matter that cannot be neglected. Even though a region's industrial development is in line with regional development, they are still different from each other. For example, their orientations and values are not totally the same: industrial development is enterprise-oriented, while regional development is local-residents-oriented. Enterprises are not bound by location, and therefore they can relocate in any region so long as they yield profits. Only when an enterprise locates in a particular region, the enterprise could possibly be of value to this region; if it relocates to another region, its "value" to the region will be thereby lost. Therefore, each region needs to keep proper industries to benefit their own development. As we all know, "even a wise bird selects it tree", and therefore, it is understandable that good enterprises elect to locate in wherever their business is profitable, which is the very logic behind industrial development. In other words, industrial development prioritizes the "competitiveness of enterprises". In contrast, regional development prioritizes "the value to the region".

Therefore, rather than just consider the competitiveness of enterprises, each region also needs to find out whether an industry can be of great value to the region or contribute a lot to regional development. On the other hand, an attractive region must support relocated enterprises, enabling them to be competitive enough, otherwise enterprises will move to other regions, which is the very logic of industrial development, i.e., "prioritization of the competitiveness of enterprises". In the real economic world, the relationship between regional development and industrial development is usually very complicated. For example, will the region benefit a lot by providing enterprises with low-price land and various preferential policies? If the region wants to retain an industry (to support the competitiveness of enterprises), will it harm realistic and long-term interests of the region, especially local residents? If industrial development relies on exploitation of local resources, will the interests of enterprises and the region be well balanced and coordinated? Once local resources are exhausted, how to sustain regional economic development and safeguard people's livelihood?

In particular, environmental standards and requirements are also rising with the improvement of the level of economic development. Besides, the relationship between industrial competition and the quality of life is also changing. The practice of preserving industrial competitiveness at the expense of the quality of life has now been less recognized by the society. On the contrary, the environment and the quality of life will become important factors attracting and supporting quality industries and therefore constitute the basic components of a region's competitiveness.

Therefore, while each region seeks to attract and cultivate competitive local industries, improvement of the region's value will also become more important. Each region must neither resort to "cut-throat competition" nor "kill the goose that lays golden eggs", but instead it should respect the interests and wishes of "local residents". The industrial development pattern that might undermine the value of the region will be hardly recognized by residents, and each region has to face such realistic challenge in the process of industrial development.

Human survival and development should meet some material conditions, i.e., natural conditions and man-made conditions. The former is natural wealth, while the latter is the wealth created by humans mainly through industrial production. Industry is essentially a process of turning useless things into useful products. Before the 1970s, China was extremely poor and severely lacked "man-made" wealth. As a result, production of major industrial products was then considered the goal of overriding importance. Jinxi Wang, a rig manager of Daqing Oilfield, one of the representative figures of China's then industrial spirit, ever said, "I would give up 20 years of life, so China can produce oil on its own land." His words marked the very spirit of that age in China!

Since the 1980s, each region wanted desperately to create wealth ("man-made" wealth) to lift people out of poverty, which has however caused huge and irreversible damage to the environment (natural wealth). A local leader ever sighed over the environmental degradation caused by industrial growth, "how can it be possible for us not to know the consequences of environmental damage? But in time of poverty we had no alternatives. Although we knew that it is a "poison", we still had to drink it in order to survive. In that era, people, being ignorant and fearless, all "competed like hell"! They were ignorant of how huge price humans would have to pay for ecological damages! If human activity turns into plunder of nature, humans will have the opposite of the desired effect! However, it is no use just denying or condemning what we did in the past! Luckily, we have already created considerable wealth, and therefore we can say with great confidence that we want both wealth and good environment! Surely, when we have enough wealth, we can even say proudly, "For the sake of clean water, green mountain and blue sky, we would rather not pursue wealth." However, China now hasn't had so much wealth yet, and therefore it still needs to make greater efforts to build itself into a moderately prosperous society in all respects, and each region must expand further its space for economic growth to meet higher development goals.

As China is currently in the era of "moderate materialism", industrialization and creation of material wealth are still the major goals, but at the same time, environmental protection and improvement of life quality are also becoming increasingly important. Besides, how to weigh economic development against environmental protection also becomes a core issue. When each region seeks to expand new space for economic development, they are actually trying to take a new path to development, i.e., innovative, coordinated, green and open development that is for all in order to make people live a life of higher quality. Just like some scholars pointed out in their research, "In general, China is faced with rather great ecological pressures. The plunder of nature has far exceeded the nature's supplying capability; its huge

demand for natural resources will not be met unless China is 3.4 times the current size. Without any proper preventive measures, the environment would get worse and lead to irreversible consequences."[4]

7.5 New Challenges for Local Governments

In the new era, the national pattern of economic development is changing, and so is regional industrial development. Thereby, local governments are facing many new challenges while trying to promote local industrial development. The most profound problems are as follows:

First, what can local governments do to promote local industrial development? In the past three decades, local governments remained the major forces behind pushing regional economic development, mainly relying on preferential policies to attract investment. But from now on, "preferential treatment" and excessive use of incentives (carrots) have become less and less effective in attracting investment; in some relatively developed regions, supply of land for attracting investment is diminishing. So, in what ways can local governments do to attract enterprises? How to improve local environment to retain industries and promote technology upgrading? Even though all regions vary in the level of economic development, they all have something in common, that is, they all need seize two opportunities for industrial development both at home and abroad, namely, industrial distribution adjustment and new industrial revolutions. They should support enterprises to make new adjustment to spatial distribution of industries and industrial chains, in particular to shift from "preferential-policies-driven development" to "indigenous-technology-innovation-driven development" so as to create new forms of business. Regions that are developed enough should be devoted to inventing leading technologies in a certain industry, i.e., building globally competitive industrial clusters. Therefore, local governments' policies of supporting industrial development should shift from "horizontal" industrialization to "multi-dimensional" industrialization.[5]

The industrialization history of developed countries proves that technological innovation in industrial development is a complicated and constant process. There are four categories of assets for innovation, namely, "scientific research asset, process innovative asset, product innovative application asset, and aesthetic design asset" [6]. Besides, in different industrial technology innovations, such as "disruptive innovation", "incremental/radical innovation" and "continuous innovation", all enterprises of different sizes, large, medium-sized or small enterprises, have their distinctive advantages and disadvantages. And moreover, as for different types of enterprises, their innovations tend to vary in the four stages of industrial (product) life cycle, namely, introduction, growth, maturity and decline. To put it simple, each type of

[4] Shi and Wang (2016).

[5] Jin (2003).

[6] Freeman and Soete (1997a).

enterprise tends to be good at making a certain type of technological innovation at a certain stage of industrial life cycle. So, in order to create industrial clusters good for industrial technology innovation, each region should strive to attract all enterprises of different sizes, large, medium-sized or small and grant no preferential policies. A sound environment ensuring freedom and fairness is most conducive to constant innovation.

More importantly, it is local government's responsibility to create an industrially advanced society for local industries. A great many studies conducted by economic historians show, "…local infrastructure, externalities, especially in skills and labor market, specialized services and, not least, mutual trust and personal relationships have contributed greatly to flourishing regions."[7] Industrialization is not only creation of material technology, but a civilizing process. In order to build a region into a gathering place of sustainable and dynamic modern industries, the local government should cultivate and encourage the industrial spirit, i.e. down-to-earth, pro-industry, entrepreneurial, innovative, and skills-based development, and create the social atmosphere of integrity, cooperation through division of labor and fair deal. In other words, they should try to amass more "social capital" for the development of modern industries.

Second, which one should local governments mainly serve, enterprises or residents? In other words, should local governments be pro-business or "put people first"? Chinese governments at all levels are to a large extent "development-oriented governments", which means development takes priority in China and Chinese governments seek to make indigenous innovations, believing that "development is of overriding importance". For the sake of development and innovation, governments must be pro-business. That is to say, local governments must provide enterprises with satisfying services and consider these enterprises' interests in resource allocation to make their regions more attractive to industries so that their goal of GDP growth will be realized as soon as possible. Many official documents issued by local governments stated very clearly that policies should be "pro-business", which is surely a practical way to enhance the region's competitiveness and thus to realize the goal of economic development.

However, it should be noted that "pro-business" policies do not mean to neglect the interests of local people, and "development-oriented" government does not mean to replace "service-oriented government", either. In particular, with the improvement of the level of economic development, people are more and more aware of their rights and democracy, and thereby more and more ready to participate in public affairs. If people's interests and wishes are ignored, industrial development would suffer strong resistance. In recent years, "Not in My Backyard" phenomenon occurred one after another in China, that is, local residents tended to oppose neighborhood investment programs that might threaten local environment and security, which is a typical result of local governments disregarding people's interests. When income per capita increases to a certain level, people begin to attach greater importance to their livelihood and welfare, and therefore local governments also begin to "put people

[7] Freeman and Soete (1997b).

first". For example, local governments must show more concern to environmental issues to meet people's rising demand for environmental protection; as people's desire for social security and welfare grows, government spending on welfare increases dramatically, and the minimum wage also rises very rapidly in each region. Some scholar believes, "In terms of social protection, China has indeed undergone an unprecedented 'great leap forward' over the past ten years", but at the same time, "China still has many deep problems in such aspect, and people still strongly want social protection to be further improved".[8]

However, either pro-business policies or "putting people first" produce costs. Neither an excessively pro-business government nor an excessively people-centered government is advisable. Moreover, there is usually a certain level of trade-off between being pro-business and "putting people first". As resources are always limited and it is particularly true of government financial resources, a reasonable order of priority must be given and a certain limit must be set over these decisions, which is a realistic challenge for each local government.

Third, how should local governments deal with the relationship between economic regions and administrative divisions? Just as abovementioned, there is a widening trend of regional economic integration, and inter-provincial economic integration will become a notable trend in China's industrial development, which indicates a growing tendency of regional economic coordination to exceed the boundaries of administrative divisions. Therefore, as for regional industrial development, one of the important ways to bring the role of government into better play is to explore compatibility between administrative rules and the law of regional economic development. Local governments should serve as both driver of industrial development and the coordinator of regional relations so as to realize economic opening-up, management integration and mutually beneficial cooperation between neighboring administrative regions and thereby create a more reasonable pattern of regional industrial distribution.

A major function of government in promoting regional development is to formulate and implement plans for regional development. The historical truth is that when the regional development plan is restricted to just one administrative division, it usually proves very effective; but when regional development plan covers more than one administrative division, in other words, if the plan involves different administrative divisions, the result often turns out to be less satisfactory. It is not hard to understand, because local governments are accountable for affairs in the administrative division within their jurisdiction. If economic coordination oversteps the boundaries of their administrative division, local government's accountability and effectiveness would be "suspended". However, the objective relationship between regional economies and the law of regional development are not bound by administrative boundaries, and inter-administrative-division regional coordination is an inevitable trend as well as a necessary policy. Therefore, to deal with the relationship between economic region and administrative division is a very important issue concerning regional economy, having a great bearing on industrial development, especially the spatial distribution

[8] Wang (2013).

of industries. Many problems such as overcapacity, duplicated investment, waste of resources, environmental damages, local protectionism and even law enforcement injustice, are all directly related to local government's failure to deal with the relationship between industrial development and regional development well. If economy is also divided in the same way as administrative division, it would prevent regions from gaining momentum.

On the other hand, local governments also adopted consciously or unconsciously many regional discriminatory policies and management measures in order to manage local affairs more effectively, which manifests itself in traffic infrastructure. For example, there are many dead-end highways or railways that are supposed to extend to another region; two roads cannot be connected very smoothly; restrictions are placed on non-local cars entering the region; local cars and non-local cars are treated differently in traffic restriction. Such discriminatory policies will impede the creation of a unified and open market across the country as well as fair competition between one region and another, and affect people's lives, too.

The decision on an all-round push for further reform adopted in the Third Plenary Session of the 18th Central Committee of the CPC proposed, "Economic structural reform is the focus of an all-round in-depth reform, with how to strike a balance between the role of government and that of the market, how to let market play a decisive role in resource allocation and how to let the government play its functions better lying at its core." This is the fundamental principle for the handling of the relationship between economic region and administrative division. When it comes to the issue of inter-administrative-division regional development, local governments should consider first how to better "the market's decisive role in resource allocation", but in the meantime they should also find ways "to let the government plays its functions better".

Fourth, what should local governments do to solve the problem of regional imbalances more effectively? Due to differences in location and history, imbalance of economic and social development is a long-term phenomenon. And moreover, each region with unique regional features will surely play different roles due to division of labor. Since the reform and opening-up, China has been practicing "special policies" for over three decades, letting the regions with favorable conditions get rich first and then help others to get rich later. However, some less developed regions, such as the central and western regions, have begun to witness a higher economic growth rate than coastal regions in recent years, which indicates a general tendency towards balanced regional development. But the gap between regions in terms of economic development is so big that it is impossible to close in a very short period of time, and therefore it still remains a major aspect of China's regional economic policies to achieve balanced regional development.

However, entering the era of "Free Trade", China will have to adopt a different approach to reduce regional imbalance. Though poor regions still need special aid, "special policies" will cease to be the main driver of economic development. Rather, widening of economic integration, equalization of public services, and rationalization of resource revenue sharing will become key public policy tools to promote balanced regional development. That is to say, the previous mentality of "using special policies

to close the regional gap" will be replaced by the policy of "ensuring fairness to promote efficiency" to a large extent.

To sum up, in the new era of industrialization, China's policies for economic development are changing significantly, and so is the trend in regional industrial development. Regional economic policies, which used to be biased, differentiated and administrative, are now changing into more open, unified, and fair ones. Not only the spatial distribution pattern of industries is changing, the dynamic mechanism for regional industrial development will also change profoundly. Previously, industries' spatial growth was mainly driven by the use of low-cost resources, subsidies as incentives, and preferential policies; in future, fair, open and transparent market rules will be ensured in a unified, open and orderly market system, and therefore their spatial growth will be more driven by technological innovation, distribution optimization and collaboration. In order to comply with the trend in regional industrial development, local governments should strive to better their role in promoting, guiding and supervising industrial development to ensure Chinese industries' structural and technological upgrading at regional level.

7.6 Promoting Synchronization Between New Urbanization and "Four Modernizations"

Urbanization is directly related to regional economic relations in industrialization. Urbanization is not only the major direction of economic and social progress and modernization, but a key aspect of China's economic restructuring in the process of industrialization. With the constant deepening of industrialization, people come to realize that only if China continues to "put people first" while striving to promote urbanization will the major structural problems hindering sustained and healthy economic development be solved and a moderately prosperous society be thereby built in all respects.

The urbanization of China's mainland was very slow from 1949 to 1978. From 1950 to 1980, world urban population (% of total) rose from 28.4 to 41.3%, that of developing countries from 16.2 to 30.5%, but that of China's mainland just from 11.2 to 19.4%. But during the almost same period of time (1949–1978), China's gross value of industrial output increased by 38.18%, the proportion of gross industrial output in gross industrial and agricultural output grew from 30 to 72.2%, gross social product increased by 1244%. Since 1978, the pace of urbanization has greatly quickened. China has ever conducted six National Population Censuses from 1953 to 2010: the level of urbanization is 12.84% in 1953, 17.58% in 1964, 20.43% in 1982, 25.84% in 1990, 35.39% in 2000, and 49.68% in 2010. According to National Bureau of Statistics of China, in 2015, China's urban permanent resident population is 771.16 million, and the rural permanent resident population is 603.46 million, and urban population (% of total) is 56.1%.

Urbanization reflects the systematic changes in modes of human existence. Urbanization in a general sense refers to the trend of an increasing number of rural people gathering and settling down in places as a result of changes in the basic mode of human existence, i.e., their way of life and work. From the perspective of economics, human's basic activity is production and consumption. Cities and towns, where humans are concentrated, provide suitable conditions for human production and consumption. Such activity in urban areas is much greater in both size and quality than in rural areas; and moreover, the former tends to be more innovative and more capable of making progress than the latter, too.

In the long history of mankind, the era of industrialization spanning two to three centuries is the period in which modes of human existence have changed most dramatically. Entering the era of industrialization, thousands of cities and towns rose as a result of rapid industrial development, and further development of these cities and towns attracted more people and industries to these places. Urban industry has thereby become the most competitive sector, and most scientific inventions were put into use in the industrial sector in urban areas to make industrial technology innovations and structural upgrading. To sum up, industrialization is a great revolution in terms of modes of human existence, and urbanization goes hand in hand with it. Industry provides the material basis for urbanization, and urbanization improves the competitiveness of industries. Industrialization and urbanization went hand in hand, ushering in the most splendid era of human development, whose wealth is even more than the sum of wealth over the past several thousand years.

China's industrialization and urbanization also go hand in hand, being complementary and mutually beneficial. Industry leads to the rise of new cities (or turns previous "consumption cities" into "production cities"); cities provide places for industries to gather together and thereby create huge wealth. During this process, most cities adopted the same pattern of development: industrial development, development of industrial parks, and city construction. Most regions were seemingly telling the same story: attraction of investment, rural migrant workers, strong industrial cities, the rise of new cities, transformation of old cities, etc.

Rural people's migration to cities for work has not only replenished the urban labor force, but has become one of the most effective ways for them to get rich. It can be said that industrialization and urbanization have totally changed the way of life of urban and rural residents and greatly promoted the process of China's modernization, which is the basic way to build a moderately prosperous society in all respects.

Urbanization is a great invention of mankind in the process of industrialization. Industrialization and urbanization have changed the world geography swiftly and entirely. They are not only the great embodiment of human rationality, but the most splendid achievements that humans have ever achieved thanks to science and technology as well as the great productive forces. However, humans might also get lost in such historical process, resulting in urbanization going against the principle of "putting people first" and thereby going astray. Failure to put people first will be fatal to urbanization. For example, it might lead to structural imbalance of industrial and urban development. If industries and cities develop blindly, it might sabotage the relationship between industrialization and urbanization: chances are that, due to

lack of local industries, local residents will have difficulty finding jobs in their own cities or towns, which will thereby be reduced to "poor cities", "sleeping cities" or "empty cities"; it is also likely that due to lack of high-quality urbanization, non-local industries that relocate to cities and towns will hardly remain competitive for long; the extensive growth pattern seems to have created a production boom, but these regions can hardly retain talent; and moreover, these industries can neither take root nor take the lead in a certain technology; or cities and towns might be less tolerant, resulting in the failure of marginal group to fit into the society in a rather long period of time and thereby giving rise to sharp conflicts of interest. All in all, industrial and urban development is still at a rather low level in terms of both structure and quality. Such low-quality urbanization tends to cause serious structural problems as follows:

First, it did turn cities into intensely-populated places but has made life there more inconvenient. It had been expected that more and more people migrating to cities and towns would make production and life more convenient and improve productivity and life quality, but instead all just went in the opposite direction due to disorderly migration and ill urban management. Living costs increase too rapidly, production services and living services are in short supply with low quality, movement of workers and supplies within and between cities are not free enough. Life there seems to be full of never-ending problems: heavy traffic, difficulty in seeing a doctor, bureaucratic red tape, etc.

Second, it was meant to avoid risks but it just ended up with more dangers. People who migrated to cities and towns had intended to avoid or reduce disasters or risks, and the "city" is meant to protect people and property from harms and damages. However, bad urban construction and management had made city life less secure, but instead, cities were turned into high-risk places full of crimes, car accidents, job-related injury, fire accidents, environmental pollution, disease transmission, workplace accidents, unhygienic food, civil unrest, etc. Urban residents feel that their living environment is highly perilous and rural migrant workers feel even more insecure after their migration to cities.

Third, it did attract more people to migrate to urban areas, which has, however, hindered the process of integration. As cities and towns tend to attract more people and be more inclusive, urbanization is supposed to turn more rural people into urban residents. However, due to material and institutional deficiencies, it turns out to have hindered the process of social integration, resulting in social divide, the widening of urban-rural gap, the worsening of hierarchical oppression, institutionalized discrimination and wealth inequality, and thus people's great dissatisfaction.

Fourth, it did create more wealth but tended to make people feel less happy. Industrialization and urbanization are great achievements of mankind in creating wealth, but low-quality urban life failed to make people feel happier; rather, they feel even better in the countryside, which is though less flourishing, as country life doesn't make people feel depressed, worried and even resentful as urban life.

Is urbanization a comedy or tragedy? What will rural workers, who migrate to cities to pursue their dreams, eventually end up, becoming urban residents or being marginalized? They both depend on whether urbanization has "put people first" or not.

There have been many controversies over the understanding of urbanization and the selection of urbanization path during the process of China's industrialization. After decades of twists and turns, people have eventually realized that "putting people first" and "seeking to improve people's well-being" should be at the heart of new urbanization.

Cities and towns are the symbols of human civilization, and modern man all aspire to live in cities or towns. They are expected to be places of higher productivity and greater harmony, whose culture is more diversified, whose environment is more livable, whose safety is better ensured, and whose economy and social and political influence are strong enough to promote urban-rural integration and build a resource-conserving and environment-friendly society. In order to make that happen, China must take a new path to urbanization by "putting people first".

Basic activities of urban residents are usually work, leisure, living and transport. So, people must be provided better conditions for startup and employment, better leisure facilities, a better living environment and more convenient transportation. Cities must have good city planning in terms of infrastructure to secure people's needs for work, leisure, housing and transport.

Throughout the human life cycle, the span of a human life consists of different stages, including childhood, adolescence, young and middle adulthood and late adulthood (i.e., old age), and therefore humans tend to have different needs for work, leisure, housing and transport at different stages. In particular, all humans, who are mortal, have to experience birth, aging, sickness and death. So, urbanization is essentially a drive to satisfy urban residents' material, cultural and spatial needs at different stages of life in a better way. As for what should be addressed by households, what by enterprises or non-profit organizations, and what by public service system established by governments and social organizations, systematic planning and organization, institutional guarantee and policy support must be ensured in the process of urbanization.

One of the major directions for human development is to avoid risk and seek security. For thousands of years, human beings have invented various material ways and institutions to avoid risks, but we still couldn't find our way to absolute security so far. On the contrary, modern society is still a high-risk society. Therefore, aside from regular mechanisms and management systems, emergency mechanisms and management systems in times of crises should also be established to meet the requirement of urbanization.

Mankind need preserve memories of civilization, and cities and towns are the very places that carry these memories in the form of material wealth and cultural and intellectual products. Every city has its own past, present and future, during which tangible and intangible cultural heritage are created, preserved and thereby form human civilization. So, things that are preserved in cities and towns such as historic sites, cultural museums, and landmarks are the most precious wealth and everlasting memories of mankind. To destroy the history of these cities is to erase human civilization, and cities and towns without memories of evolution or development are just like patients suffering from Alzheimer disease. So, urbanization should contribute

most to preservation of human civilization rather than destroy civilization and erase history. Man fear forgetting, as it is the biggest misfortune.

Currently, many cities are striving to create "happy cities", and they will surely put people first. Urbanization is actually a process of letting more residents enjoy a happy life, that is to say, it will not only make local residents much happier, but make rural migrant workers feel the same way, which will be the ultimate result of new urbanization that puts people first.

According to the target set by the 18th National Congress of the CPC, China is to build a moderately prosperous society in all respects by 2020. In order to achieve this goal, China is to advance industrialization, IT application, urbanization, and agricultural modernization simultaneously.

Industrialization is the theme of China's economic and social development at the current stage. In general, both China and the whole world are currently in the era of industrialization. Industrialization is the biggest driver of social productivity improvement. In order to seize the golden opportunity and achieve fast, healthy and sustainable economic growth, China must be firmly committed to a new type of industrialization. Only a new type of industrialization can ensure advanced productive forces and great accumulation of material wealth necessary for the building of a moderately prosperous society in all respects. It is the very condition that must be met before China solves all major economic and social problems, problems concerning people's livelihood and welfare, and national security problems.

IT application is one of the most prominent features of modern industrial system and the imminent era of new industrial revolutions; besides, it also provides the strongest support for technological and organizational innovations while China strives to promote a new type of industrialization. If it is deeply combined with industrialization, China will see a huge boost in productivity, optimal resource allocation, greater space for human development, and higher living standards of its people. All in all, IT application can provide high technologies and a digital network platform for the building of a moderately prosperous society in all respects. This is a key strategic issue that determines whether China could conform to the trend of global scientific and technological progress and new industrial revolutions and enhance its innovative capacity and international competitiveness as well.

Rapid urbanization has brought about the greatest change of the spatial economic structure in the process of industrialization. That is to say, as the mode of production and life changes, people are more inclined to concentrate in areas and thus form big, medium-sized and small cities. Urbanization often goes hand in hand with industrialization. So, only a benign interaction between industrialization and urbanization can create a new mode of production and life necessary for the building of a moderately prosperous society in all respects and well reflect the principle of "putting people first". A moderately prosperous society is a society where people live and work in peace and contentment. Without high-quality urbanization, over 1.3 billion Chinese people would not possibly live and work in peace and contentment as expected. Therefore, urbanization must be in line with the law of development and suit China's national conditions, which is an objective factor indispensable for building a moderately prosperous society in all respects.

Agricultural modernization is the foundation for the building of a new relationship between industry and agriculture as well as new urban-rural relations. A backward traditional agriculture cannot help solve China's structural problem of unbalanced, uncoordinated and unsustainable economic growth. Only when the dual economic structure characterized by the co-existence of advanced urban industry and backward agriculture is radically changed, a moderately prosperous society in all respects will be built successfully. So, agricultural modernization might cause a bottleneck in the process. In some sense, it can even be said that agricultural modernization is an important yardstick of success for industrialization. In other words, only an industrialized and information-based agriculture which is highly integrated with modern industry and service industry can ensure the building of "a moderately prosperous society in all respects" in terms of production technology, industrial organization and social values.

To sum up, as far as "the building of a moderately prosperous society in all respects" is concerned, a new type of industrialization is the prerequisite, high-level IT application is the key, new urbanization is the trend, and agricultural modernization is the very foundation. Only the simultaneous achievement of industrialization, IT application, urbanization and agricultural modernization can ensure that a moderately prosperous society in all respects will be built successfully.

It should be noted that such a society must be moderately prosperous in all respects, which is of critical importance. That is to say, what we need is more than a rich and strong country, fully-tapped sources of social wealth, advanced industries, flourishing cities and a livable environment. In addition, China should also try to solve various problems such as unbalanced, uncoordinated and unsustainable economic growth so as to eradicate unfairness and injustice. So, China must advance industrialization, IT application, urbanization and agricultural modernization simultaneously to promote further improvements of both productive forces and relations of production and thereby create a more just and equitable society.

Fundamentally, the simultaneous advancement of a new type of industrialization, high-level IT application, new urbanization and agricultural modernization will generate a more balanced, coordinated and sustainable economy; besides, it can also ensure higher transparency and fairness in terms of economic and social operation as well as a greater sense of happiness among people. All in all, it can not only boost economic growth in the real economy, but promote the building of a moderately prosperous society in all respects, which will have profound implications for the whole society and system improvement.

References

Freeman, C., & Soete, L. (1997a). The economics of industrial innovation (3rd ed., p. 285). Routledge.

Freeman, C., & Soete, L. (1997b). The economics of industrial innovation (3rd ed., p. 315). Routledge.

Jin, B. (2013). China's strategic direction of industrial structural adjustment in the current phase. *Qiushi Journal, 4*.

Jin, B. (2015). Reform dividends and economic convenience. *China Economist*, *2*, 28–32.

Kohen, S. B. (2008). *Geopolitics: The geography of international relations* (2nd ed., p. 37, p. 39). Rowman & Littlefield Publishers.

Shi, D., & Wang, J. J. (2016). Measurement and evaluation of China's ecological pressure and ecological efficiency based on ecological footprint. *China Industrial Economics, 5,* 5–21.

Swann, P. (2014). *The economics of innovation: An introduction* (pp. 215–216). Edward Elgar Publishing.

Wang, S. G. (2013). Is China still a low welfare state?—A "New leap-forward" in China's social protection from a comparative perspective. *Comparative Research, 11,* 70–94.

Chapter 8
An Inclusive World: Entering a New Era of Economic Globalization

A young Israeli scholar Yuval Noah Harari wrote in his very influential book entitled *Sapiens: A Brief History of Humankind*, "…the voyages of Admiral Zheng He of the Chinese Ming dynasty heralded and eclipsed the European voyages of discovery. Between 1405 and 1433, Zheng led seven huge armadas from China to the far reaches of the Indian Ocean. The largest of these comprised almost 300 ships and carried close to 30,000 people. They visited Indonesia, Sri Lanka, India, the Persian Gulf, the Red Sea and East Africa. Chinese ships anchored in Jedda, the main harbor of the Hejaz, and in Malindi, on the Kenyan coast. Columbus' fleet of 1492—which consisted of three small ships manned by 120 sailors—was like a trio of mosquitoes compared to Zheng He's drove of dragon." "Moreover, the expeditions of Zheng He were not deeply rooted in Chinese politics and culture. When the ruling faction in Beijing changed during the 1430 s, the new overloads abruptly terminated the operation. The great fleet was dismantled, crucial technical and geographical knowledge was lost, and no explorer of such stature and means ever set out again from a Chinese port." "The resources that sent Zheng He from China to East Africa in the 1420 s should have been enough to reach America. The Chinese just weren't interested."[1] The country that had been "not interested" for several thousand years took the initiative to return to the world stage in the middle of the 20th century, hoping that the world in the 21st century would be an inclusive one.

8.1 China's Industrialization: A Rare, Tremendous Change in the History of Humankind

China officially became a member of the World Trade Organization on 11 December 2001. Becoming a member state of the WTO might not be a great deal for most countries; and as for WTO, having one more member state is nothing to be cheered.

[1] Harari (2014).

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However, China's entry into the WTO is a landmark event of special significance, not only for China, but for other member states and even the whole world. The admission of China to the WTO was preceded by a lengthy process of negotiations. At the moment when China was officially admitted to WTO, the whole world seemed to be all excited about it, though they might be more or less wary of it, which is understandable and inevitable. So, why did China's accession to the WTO draw so much attention from the world? How will China abiding by the WTO rules influence the world? Under WTO rules, in what ways will China's industrial economy be changed and in what direction will it go?

Different groups of people tend to view China's current economic development differently. In many foreigners' eyes, China is the world's fastest growing economy, which was ever considered as a star "outshining" others; China's industrial competitiveness grows in a shockingly fast speed that has caused great fear in some countries (the so-called "China threat" theory); China has absorbed huge industrial capital and production capacity, resulting in the "hollowing-out" of neighboring countries' industries; according to some foreign economists and world organizations such as World Bank, China has already been the world's second largest economy, with its aggregate economy being just next to the United States if it is calculated by purchasing power parity.[2] China's development has attracted worldwide attention and the whole world is amazed by and even somewhat worried about its spectacular development. But in Chinese people's eyes, China, which used to be an extremely poor country, is now still a low-income developing country, and it's only right and proper that China should take the path of industrialization and seek high-speed economic growth, as industrialization is just a late experience for China and its high-speed economic growth at the current stage is just the "missed lessons" that China ought to make up for. So, they wonder why some people make such a fuss about it.

Is there anything special about China's industrialization? To look back at each modern country's history, we find that, in the history of mankind, there has never been such a country with such a large population as China (1.3 billion people) having managed to lead the whole economy to carry out industrialization. When China entered the period of industrialization acceleration, the whole world population was over 6 billion, but major industrial powers' overall population was just 0.65 billion, which is less than 2% of the world population. It took these countries over 200 years to complete industrialization. Besides, in the period of high-speed industrialization, each of these countries just had tens of thousands of people. That is to say, seven to eight countries, altogether just accounting for less than 12% of world population, finished industrialization successively within over 200 years. By comparison, China, a unified country with a large population of 1.3 billion people accounting for around 20% of world population, has to finish industrialization just within several decades (see Table 8.1). So, even though they have all undergone industrialization, many "domestic economic problems" arising in China are far larger than some "world

[2]According to the World Bank report (2000/2001), China's GDP per capita is US$780 if it is calculated by the current exchange rate, and US $3,291 if by purchasing power parity. If calculated by the current exchange rate, China's GDP ranks No. 7 in the world; but if calculated by purchasing

Table 8.1 Comparison between China's population and the population of major industrial powers (1999)

Country/Region	Population (million)	% (of world population)
In total (world population)	5978.40	
China	1259.09	21.1
Major industrial countries	706.37	11.8
Major industrial countries (in Europe)	257.27	4.3
U.K.	58.74	
Germany	82.09	
France	59.1	
Italy	57.34	
Industrial countries (in North America)	303.62	5.1
USA	273.13	4.6
Canada	30.49	
Australia	18.97	0.3
Japan	126.51	2.1
Russia	145.56	2.4

Source China Statistical Yearbook (2001), p. 879

economic problems" arising in many other industrial countries. A giant country with a high degree of unity will surely have many problems that have never occurred in the history while entering the period of industrialization characterized by high-speed economic growth. As a result, the process of economic globalization, which has lasted for almost 300 years, will dramatically change accordingly.

Karl Marx and Friedrich Engels ever wrote on economic globalization more than 150 years ago, while expounding the "very revolutionary role" of the bourgeoisie in their co-authored book *Manifesto of the Communist Party*. They wrote, "The bourgeoisie has through its exploitation of the world market given a cosmopolitan character to production and consumption in every country. To the great chagrin of Reactionists, it has drawn from under the feet of industry the national ground on which it stood. All old-established national industries have been destroyed or are daily being destroyed. They are dislodged by new industries, whose introduction becomes a life and death question for all nations, by industries that no longer work up indigenous raw material, but raw material drawn from the remotest zones; industries whose products are consumed, not only at home, but in every quarter of the globe. In

power parity, China ranks No. 2 (U.S. GDP is roughly 8.4 trillion dollars) in the world with its GDP (exceeding 4.1 trillion dollars) much higher than that of Japan (3 trillion dollars).

place of the old wants, satisfied by the production of the country, we find new wants, requiring for their satisfaction the products of distant lands and climes. In place of the old local and national seclusion and self-sufficiency, we have intercourse in every direction, universal inter-dependence of nations. And as in material, so also in intellectual production. The intellectual creations of individual nations become common property."[3]

Since the second half of the 20th century, the pace of internationalization, transnationalization and globalization of world economy has quickened with each passing day. So far, globalization of capital flows is the core as well as the most typical phenomenon of economic globalization.[4] Driven by this, many industries of many counties have become part of globalization, and transnational corporations' allocation and use of resources across the globe has become the most striking feature of economic globalization. Thanks to economic globalization, research, invention, design, production, distribution, and consumption of products and services can be achieved through various means across the globe (such as patent, database, new technology for information engagement, transportation technology and infrastructure); transnational corporations, within the system of international division of labor, all seek to meet the increasingly diversified needs of world market and regulate it through regular norms and standards; dominated by global business, they have been striving to promote global strategy, resulting in corporate capital being gradually held by foreign shareholders. In this sense, transnational corporations are more and more like "global corporations".

Though transnational corporations still have "domestic headquarters", such locations are less and less connected to the traditional sense of nationality. So, some foreign scholars believed that economic and social globalization is already turning "national capitalism" into "global capitalism". The group of Lisbon argued, "The global firm is replacing public authorities as the leading actor in directing and controlling the world economy. National economic authorities hold enormous decision-making power in economic affairs through monetary and fiscal policies, trade regulation, provision of public services, public procurement markets, public works, and norms and standards. Their power, however, has been considerably reduced by twenty years of intensive and systematic measures of privatization, deregulation, and liberalization which, conversely, have increased the economic power of private firms and private-based mechanisms and rules. Furthermore, globalization processes have contributed to the germination and diffusion of the idea that the power of national public authorities is largely negative, that is, an obstacle to the fully free functioning of the market economy at both the international and global levels. The nation-state's action has been presented as source of constraint and not of opportunity."[5]

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[3] Marx and Engels (1848).

[4] Karl Marx pointed out in his speech "*On the Question of Free Trade*", "To sum up, what is Free Trade under the present conditions of society? Freedom of Capital. When you have torn down the few national barriers which still restrict the free development of capital, you will merely have given it complete freedom of action." Marx (1848).

[5] The Group of Lisbon (1995).

What is more substantive is that economic globalization brings about uniformity of economic rules, and the World Trade Organization is one of the best examples. The WTO requires all member states to comply with the same set of economic rules and it has effectively ensured the conformity of global economic rules. There is no denying that rules of capitalism dominate the current world, especially global economy. So, China will have to face two fundamental challenges head-on after its integration into global economy. First, China, as a developing country, has to deal with polarization, an inevitable trend under capitalist market economy, and its possible bad consequences. Second, China, as a socialist county, has to be well prepared for any counterbalancing influence of capitalism on socialism.

Due to these two fundamental challenges (development gap and different systems), many developing countries have ever held doubts over economic globalization, and so far, most of them still have some degree of reservations about being part of economic globalization. It is proper to say that many developing countries are just forced to accept globalization rather than join it voluntarily. China also had serious reservations about it for a rather long time. It is completely understandable to hold some degree of doubts and vigilance over economic globalization, a double-edged sword. No one can be one hundred percent sure that globalization will definitely benefit most or even all countries; and no one can be one hundred percent sure that globalization will definitely bring more income, wealth, and welfare to the whole world, especially developing countries, either. Moreover, it is inevitable that interests of some countries and people will be harmed during the process.

However, economic globalization is an objective truth independent of man's will in the current world. Any country opening to the outside world will surely be globalized. If a country refuses to open to the outside world, it is like refusing modernization, denying the process of human civilization, and even forsaking their right to live on the planet! So, economic globalization is the unavoidable trend for any country seeking modernization; it is in their interests to conform to the trend, and vice versa. One of the major reasons why China could make so spectacular economic achievements since the 1980 s is its readiness and boldness to embrace economic globalization. China has grown from an almost completely closed economy into a highly open economy as well as an active participant in the process of globalization, which has thereby changed the pattern of economic globalization.

The "trinity" consisting of industrial revolution, market economy and economic globalization has changed radically the fate of mankind and even the world. Despite tremendous changes over the past 200 years, the trinity still remains the basic pattern of human development. By now, the world is still practicing market economy, though more vigorously and deeply; the world is still advancing industrialization, though being innovation-driven; the world is still undergoing economic globalization, though with stronger momentum. The current industrialization and market economy is sharply different from the one over 200 years ago. Likewise, the current economic globalization is also different from the one in other periods. We can call the period from the 19th century till the mid 20th century, i.e., prior to the Second World War, the first economic globalization, i.e., the era of Economic Globalization 1.0; the

period from the mid 20th century till now is called the second economic globalization, or the era of Economic Globalization 2.0; at present, the wave of third economic globalization is sweeping across the globe, which is to usher in the era of Economic Globalization 3.0. In the era of Economic Globalization 1.0, China was far lagging behind; in the era of Economic Globalization 2.0, China sought to revitalize the country; while in the era of Economic Globalization 3.0, China will assume great importance in the international arena, bringing its role of major country into full play and influencing the whole world.

8.2 Globalization: An Inevitable Result of Industrial Revolutions and Market Economy

Throughout the world history, mankind's greatest institutional invention is market economy and their most spectacular achievement is the Industrial Revolution. The perfect combination of market economy and the Industrial Revolution ushered in the era of industrialization. Industrial production has turned useless things into useful things in large quantities, resulting in a dramatic increase in material wealth and thus huge wealth accumulation. As a result, the capitalist spirit of seeking to accumulate material wealth came into being and became the mainstream ideology. Market economy with a "hoarding orientation" gave rise to a common social psychology, that is, pursuit of "pleasure in possession and property".[6]

Unquenchable thirst for possessing things and endless economic growth require an infinite market. So long as there is enough market space, economy will grow infinitely until the whole world is involved in the huge wave of market economy. Adam Smith, a famous classical economist who studies the basic law of market economy, analyzed systematically in *The Wealth of Nations* the strong tendency of market economy to expansion. He argued that, human instinct for exchanging things and desire for more wealth led to constant deepening of division of labor and expansion of market, improvement of economic efficiency, increase in economic output, great accumulation of national wealth and at last the rapid development of human society. In other words, market economy basically characterized by exchange behavior is driven by the deepening of specialization and expansion of market. As a result, exchange relations will extend beyond national borders and even across the globe. So, market economy is in essence not only "national" but "global", that is to say, it is not only important for an economy to create a unified national market, but very necessary to transcend national borders so as to open a global market and integrate with global economy.

Based on Adam Smith's absolute cost advantage theory (each of the two countries tends to produce commodity at an absolutely lower production cost than the other and the exchange of goods under such circumstances will benefit both sides), David Ricardo proposes the comparative cost (or advantage) theory to further expound on

[6]Fromm (2002).

the rationality of free global trade, that is, each of the two countries can benefit most from global free trade only if it takes advantage of its certain factor endowment to produce one commodity at a lower cost than the other. If all countries do so, the benefits of the whole world will be maximized. Even though the initial hypothesis of such theory is that "factors cannot move but products can", the theory of free trade has already further developed to the extent that "factors (capital and personnel) can flow internationally". In this sense, classical economists laid a preliminary theoretical foundation for economic globalization and proved its rationality and legitimacy as well. As a matter of fact, rapid development of capitalist market economy in the 18th and 19th centuries has indeed created the first wave of economic globalization. The economic globalization was then even more "radical" than the present time, believing in the necessity of free trade, free international investment and in particular free international flow of personnel, i.e., free migration.

Karl Marx ever expounded on the global expansion of capitalist market economy. Marxism is "global", because it seems to classical Marxist writers that industrial revolution knows no national borders, and that capitalist market economy, which is in essence international and global, cannot tolerate any barriers preventing goods, capital and labor from moving freely across national borders. So, the economic form of future society (communist society) will also be global, and by then the form of country will inevitably "disappear". It can be said that classical Marxist writers were the first scholars to ever study and analyze systematically economic globalization and its consequences. Karl Marx also predicted that once globalization of capitalist market economy touched oriental countries (such as China), it would disrupt their old order, too.[7] That is to say, due to the trend of globalization of capitalist market economy, all countries including oriental countries, which are sharply different from western countries, would get involved in the process and be thereby integrated into capitalist market economy, so any efforts to prevent economic globalization would end up in vain. In 1904, a very famous but controversial British geologist Halford John Mackinder argued from the perspective of geography and geopolitics, "the whole of the world has become one, and has become one political system."[8]

Surely, it does not mean that market economy did not suffer any setbacks in each country's development. Rather, mankind has been trying for numerous times to find alternatives to market economy, and such history is not shorter than that of market economy. But history so far has shown that any non-market-economy development path was doomed to failure; or at most it just ensured a very brief success, which would disappear very soon. In the global economic system with market economy as the mainstream, any country or economy attempting to adopt closed-door policies is doomed to suffer economic stagnation or depression, or to be eliminated by market economy, or to be reborn in the fire of market economy.

To sum up, so long as market economy is practiced, the trend of globalization will be unstoppable. In the 19th century, western market economies led by Britain launched the first wave of economic globalization. In the mid 20th century, the United

[7] Marx (1853).

[8] Mackinder (2004).

States became the leader in promoting the second wave of economic globalization. During such process, many newly industrialized countries ever refused to be part of globalization, trying to build themselves into rich and strong countries through closed-door policies; but none of them succeeded. Afterwards, they had to adopt opening-up policies, integrating themselves into global economy under the banner of "free trade". What still remains fresh in our memory is that eastern Europe led by the former Soviet Union and some Asian countries such as China ever made very splendid achievements in the 20th century after having taken a non-market-economy path, i.e., socialist planned economy: their economic growth rate was ever higher than that of capitalist market economies, and they even created another economic world running parallel to market economy; but they did not succeed at last—either being disintegrated or "adapting to" market economy. As the vitality, inclusiveness and global competitiveness of non-market-economy is after all not comparable with that of market economy embracing globalization, and therefore they had to abandon planned economy and integrate themselves into global market economy eventually.

The whole world is currently in an era when the second Industrial Revolution is speeding up spreading to all emerging economies and the third Industrial Revolution is just unfolding, a time when the second wave of economic globalization is still at its peak and the third wave of economic globalization has just started. The great pace of the second economic globalization, which is grounded on the second Industrial Revolution, has brought about profound changes to the world political and economic pattern. So, any country and even the whole world will hardly adjust to the complex reality or the crisis-ridden situation and thereby be doomed to "decline after flourish", unless it goes for a new reform.

Economic globalization is a historical necessity. Nevertheless, newly industrialized countries' integration into global economy tends to be a dangerous, thorny journey rather than a rosy one, as they will inevitably pay a price and suffer as a result of it. The economically backward countries are in a dilemma about economic globalization and integration, as globalization means to open their doors to the outside world, to compete with strong foreign rivals in the international arena, and to render them vulnerable by exposing all their weakness to other countries. So, how could it be possible that weak countries will have "free trade" or "fair competition" in their encounter with great powers? Moreover, the formulation of globalization rules is usually led by great powers, while weak countries are just passive receivers of these rules, and therefore they tend to have less say in the establishment and revision of such rules. It is understandable that children tend to seek "protection" while competing with giants and the same is true of backward countries. They tend to believe that economic globalization is a neocolonialism scheme and therefore seek to close their doors to the outside world to protect themselves from it.

However, the general trend of globalization dictates that "close-door policies" and "protection" will eventually go nowhere. The longer one country shuts itself from the outside world, the farther it will lag behind, for objective laws are unstoppable. Especially in the mid-to-late 20th century, i.e., the era of Economic Globalization 2.0, the whole world witnessed a great boom: many developing countries especially

emerging economies rose in the wave of economic globalization as a result of accelerated industrialization. During such process, whether being the Four Asian Tigers (Hong Kong of China, Singapore, South Korea, and Taiwan of China) or BRICs, they all took a zigzag course, having shifted from closed-door policies to opening-up and from "protection" to freedom. China had initially resisted economic globalization, and then accepted it passively, and at last actively integrated itself into global economy, which constitutes the very course of China's reform and opening-up.

China had been hovering between the "closed-door" policy and the "opening-up" policy over a rather long period of time after western countries started the Industrial Revolution and economic globalization, i.e., in the era of Economic Globalization 1.0 and the initial period of the era of Economic Globalization 2.0. In the mid 20th century, when the People's Republic of China was founded, China just started industrialization and still tended to resist strongly economic globalization, which was then viewed by Chinese people as a great scourge. Even though China also, at that time, envied western developed countries' advanced industry and economy and ever aimed to "catch up with the U.S. and the U.K.", it still tended to resist market economy and economic globalization and continued to do so for almost three decades, which then severely limited China's strategic vision and room for development. Unable to think globally, China remained complacent about its vast territory and abundant resources, believing narrow-mindedly that it is just a continental country (just one plate of Eurasia) and thereby confining its national strategic interest just to the 9.6 million-square-kilometer inland area. Even now, the expression of "China's mainland" is still very commonly used. As a matter of fact, as some scholar pointed out, "China is a continental-maritime power, whose coastline covers approximately 32,000 km (continental coastline covering 18,000 km, and island coastline 14,000 km) and whose exclusive economic zones and continental shelf cover about 3 million square kilometers; besides, it also has over 7000 islands larger than 5 million square kilometers. China has a broad interest in sea territory accounting for one third of land area."[9]

Till the last two decades of the 20th century, China just awoke to the truth and therefore chose to develop market economy, to carry out the policy of opening-up and to integrate itself boldly into global economy. More than three decades later, China has already benefited a lot from its integration into global economy and thereby made unexpectedly tremendous achievements, such as acceleration of industrialization, huge economic expansion. By 2010, China had become the second largest world economy just next to the United States in terms of production capacity, and the gap between China and the largest economy kept narrowing while that between China and the third largest (Japan) economy kept widening. To look forward to the future, so long as China continues to develop market economy and further penetrate the global market, the boundaries of its national strategic interests will keep extending. All in all, as for China, a big country with one third of the world population, its decision to develop market economy will have profound implications for the whole world.

[9]Cao and Gao (2015).

8.3 Economic Globalization Turned Out Less Satisfactory

Humans have to accept globalization, as it is an inevitable trend. Besides, economic theories can also prove by convincing evidence that it is a good thing. As what was just mentioned, since the advent of classical economics, globalization has already been considered inevitable and viable because of the prevailing idea of market economy. Economic globalization was then believed conducive to improving the well-being of humankind, i.e., "maximization of world welfare". Influenced by the theory of comparative advantage, free trade, international division of labor, and market penetration (international market and global market), more and more countries began to accept, voluntarily or involuntarily, economic globalization and integrated themselves into global economy. Gradually, trade liberalization had come to the fore and was almost held like a religious creed.

However, reality is not as wonderful as what economic theories describe. As we can see, most countries haven't so far achieved total success in industrialization after two waves of economic globalization in the 19th and 20th centuries. Underdevelopment and poverty are still very acute problems, which has split the world into two halves, namely, the South and the North, and caused a very huge gap between the rich and poor; the core-periphery structure of the world and inequality stemming from it are still very prominent problems. Some people complain that economic globalization should have been conducted thoroughly; some people believe that developed countries are to blame, who have been pushing for globalization and liberalization worldwide and thereby led to economic polarization. Therefore, there has always been an outcry against globalization, which is, as a matter of fact, not entirely unreasonable.

Their argument is often based on the following reasons: global competition based on the law of the jungle is morally wrong; globalization is used by great powers as a pretext for their plunder of the weak; globalization did not benefit all countries equally as what supporters have been preaching, but instead it has widened international inequality; moreover, economic globalization has ruined cultural diversity and resulted in the "monotonous" oneness of the world: Human activity of seeking material wealth goes unchecked, resulting in less humanity, less dignity and less justice. Even in Britain, the home of Industrial Revolution, there also has been some cultural resistance to industry. Some scholar ever said, "Industrial values—the worship of machinery, efficiency, and material wealth—had never conquered (many insisted) the inner sanctum of the English character."[10] British elites are both looking forward to and scared of technological progress and economic growth. Even Britain held such ambivalent feelings towards industrial development, not to mention other countries, especially those underdeveloped countries, which are more apt to question or resist economic globalization featuring industrial expansion. As a mater of fact, almost every country has ever undergone such a period when economic globalization was not very welcomed.

[10] Wiener (2004).

Thus it can be seen that economic globalization was not born beautiful. The outcome of globalization tends to vary according to realistic conditions. These conditions mainly include: technology, infrastructure, geopolitical landscape, market power structure, international institutional arrangements, i.e., global governance structure (The first two will be discussed in this section, while other factors in the next part.)

As for technology and infrastructure, we can easily understand why they matter to economic globalization. Globalization requires massive trade and exchanges between countries, regions and continents; efficient international division of labor relies on smooth logistics, free personnel movement across national borders, and especially sound infrastructures, such as transport infrastructure (road, rail, air, marine), international communication facilities, and security facilities. All this must be supported by technology at certain level. In this sense, the level of technology and infrastructure conditions determine the viability of economic globalization. As economic globalization mainly involves international trade and investment, each country's level of industrial development and its status in international division of labor will also influence the outcome of globalization.

Viewed from the past and the present of economic globalization, infrastructure especially transport infrastructure has on the one hand greatly facilitated economic globalization, but on the other, infrastructure of many countries and regions especially landlocked underdeveloped countries is still a bottleneck inhibiting the process of economic globalization. As far as maritime transport is concerned, there are still many bottlenecks despite the rapid progress of global maritime industry, including maritime choke-points such as the Strait of Malacca, Panama Canal, and some ports leading to Eurasia and Africa, whose infrastructures must adjust to the needs of economic globalization, too.

Rail transportation, as a traditional way of land transportation, has indeed facilitated economic globalization a lot. Even though in some countries such as the United States, rail transport has declined as a result of losing out to road transport and air transport, on the global scale, rail transport including high-speed railway is still greatly needed in many regions especially those with vast land area, high population density and a higher concentration of economic activity, where transportation has caused a bottleneck, and thereby it will have great potential of development in these places. Therefore, railway construction is still badly needed in many countries and regions.

In terms of air transport, it is already fully developed in developed countries and regions. However, as for vast hinterlands especially underdeveloped economies with disadvantageous geographical conditions, they still need to build more airports and open more feeder lines. Only a more advanced and complex air traffic network can support the spread of economic globalization in both depth and breadth. As for road construction, driven by the general trend of economic globalization, a lot more roads including highways are expected to be built worldwide especially in areas of complex terrain, so long as engineering technology is available there.

Since the Industrial Revolution, transport infrastructure has provided necessary conditions for Economic Globalization 1.0 & 2.0. Entering the era of Economic Globalization 3.0, world economy would shift to hinterlands and marine space, and

billions of people will thereby bid farewell to closed economy and integrate with global market economy. As a result, much more infrastructures need to be built worldwide. According to the estimates of Mckinsey & Company, 57 trillion dollars would be invested globally in infrastructure such as electric power, road, port and water supply within the next 20 years.[11] Very obviously, if infrastructure is not good enough, the ideal state of economic globalization depicted by economic theories would just be a castle in the air. What deserves equal attention is that economic globalization is always conditioned by technology, and thereby each scientific and technological revolution and industrial revolution has made a difference to economic globalization. Currently, the new technological revolution (information technology and internet) is now leading the world into the era of Economic Globalization 3.0, which will have profound implications for the pattern of economic globalization.

8.4 The Evolving Geopolitical Landscape in the Context of Globalization

As what was mentioned above, geopolitical landscape and market power structure are also major factors affecting the outcome of economic globalization. To put it another way, the global economic landscape determines the relations between economies, such as competition/monopoly, cooperation/conflict. As international economic activity always occurs in certain geo-political and economic conditions, market power varies from economy to economy. So, in the context of globalization, competitors are not "atomic" manufacturers, a term used hypothetically by classic economists to prove the value of free trade; rather, they are companies with different "nationalities" in the international geopolitical architecture. Backed by their "home countries" with varying degrees of power, these enterprises will thereby display great disparity in market power.

British historian Eric Hobsbawm ever said, "The only equilibrium liberal economic theory recognized was a worldwide one." "Now the major fact about the nineteenth century is the creation of a single global economy, progressively reaching into the most remote corners of the world, an increasingly dense web of economic transactions, communications and movements of goods, money and people linking the developed countries with each other and with the undeveloped world." "But in practice this model was inadequate. The evolving world economy of capitalism was a collection of solid blocs, as well as a fluid. Whatever the origins of the "national economies" which constituted these blocs—i.e., the economies defined by the frontiers of states—and whatever the theoretical limitations of an economic theory based on them—mainly by theorists in Germany—national economies existed because nation-states existed."[12]

[11] Chen (2015).

[12] Hobsbawm (1987).

Varying levels of economic development give rise to economic gaps between countries; besides, economic globalization does not unfold, just as economic theorists put it, in an "empty box", i.e., a barrier-free world. Rather, it unfolds in very rugged conditions, including natural material conditions and geo-political and geo-economic relations. All in all, economic globalization is determined by realistic geographical conditions and geopolitical pattern. That is to say, realistic geopolitical pattern defines the features of economic globalization. Prior to the Industrial Revolution, there were many unlivable places that humans can hardly set their foot on because of tough geographical conditions. Without industry, i.e., the technology of turning the useless into the useful, there would be no "resources" at all, as "natural resources" are relative to industrial productivity. Only when humans have the very production capacity and technology (industry), vast oceans and land will possibly become the arena for human economic activity. Once they have the industrial capacity to harness vast ocean and land resources, "domains" begin to have strategic values. As a result, scramble for "domains" ushered in the "Age of Empire".

In some sense, the so-called "imperialism" is actually a scheme to form a large-scale unified market by direct territorial acquisition or by gaining control of other areas. In the 19th and 20th centuries, land power and sea power theories justified by the logic of "domain" control became the global strategy and ideology of imperial powers seeking to "occupy", "rule" and "control" other areas.

As for land power theory, people often talk with great relish about Sir Halford John Mackinder's famous words, "Who rules Eastern Europe commands the Heartland; who rules the Heartland commands the World Island; Who rules the World Island commands the world." Even though Mackinder had meant to say that geographical conditions of the "heartland" of Eurasia are important, just as he put it, "nature there offers all the prerequisites of ultimate dominance of the world"; if these heartlands are occupied, it could contribute to such dominance of the world or prevent it from happening. So, he warned "it must be man by his foresight and by the taking of solid guarantees to prevent its attainment."[13] However, just to the opposite, his theory has inspired countries with imperial dreams to seek world dominance.

As for sea power theory, people tend to boil down Alfred Thayer Mahan's theory to "whoever controls sea commands the whole world". As a matter of fact, this proposition is not unconditional. Prior to the Industrial Revolution, sea power theory would not make too much sense at all, as such theory was conditioned by material technology created since the Industrial Revolution (in the 19th and 20th centuries), i.e., the very technology ensuring that long-distance ocean shipping cost will be far less than that of air and land transportation. Therefore, maritime nations are privileged to penetrate the international market and conduct long-distance military force delivery. A strong industry means more sea power. Without a strong industry, even rich countries have to lament their inadequacy before the vast ocean, and therefore they might resort to closed-door policies or protectionism.

[13] Mackinder (1996a).

It can thus be seen that geopolitical thinking is radically different from economic globalization. All geopolitical thinking centers on "occupation", "rule" and "control"; while economic globalization focuses on "liberty", "exchange", and "openness". However, the realistic geopolitical landscape has ruined the theoretical foundation or logic of economic globalization, i.e., economic activity is assumed to occur in a barrier-free arena ensuring fair competition and transparency; but in reality, the geopolitical conditions turn out to be rather tough, just like thorny, rugged, precipitous mountains infested with bandits.

The logic behind both theories is to "seek dominance over the world" for the sake of building a unified world market. Surely, it is hard for any country, however strong it is, to dominate the world. So, either to fight or to co-exist! But co-existence requires a balance of power, which is the one thing that geopolitical and military strategy and economic globalization have in common.

Sir Halford J. Mackinder, representative of land power theory, said, "No self-respecting nation will allow itself to be deprived of its share of the higher industries. But these industries are so interlocked that they cannot be developed except in balance one with another. It follows, therefore, that each nation will strive for development in each great line of industrial activity, and should be allowed to attain to it." "For the contentment of nations we must contrive to secure some equality of opportunity for national development."[14]

The idea of balance of power ever appeared in Nicholas Spykman's book entitled *Democratic Ideals and Reality*. In the "Expert's guide to this book (Chinese version), Shoujun Cun said, "He (Spykman) argued (in the book) that the United States should not destroy Japan completely in the second world war, but instead, Japan could be reserved to balance the power of China, a country with a large population and a vast amount of land, which will sooner or later become a very strong power in Asia. Likewise, in European battlefield, Germany should be defeated rather than destroyed; rather, it should be used to balance the power of Soviet Union after the war."[15]

When Alfred Thayer Mahan, representative of sea power theory, expounds on the theory of geo-strategy, the balance of power is also mentioned. For example, "The Open Door is but another way of expressing Balance of Power; for, while conspicuously just, and making for peace—as the balance of power has—it means simply equal opportunity, just as balance of power means equal independence. But, like the balance of power, the maintenance of the open door is the result of a balancing of forces; the forces of the various states interested in the commerce and development of China, to which the phrase applies." "This newcomer by name into the policies of nations, the Open Door, this artificially sustained balance of commercial opportunity, or free competition, proposes to exclude, within the regions affected, the advantages which most people to-day secure for their own industries within the limits of their territorial control." "So the Open Door, to be beneficially effective, demands evident security of maintenance, freedom from disturbance, under the balance of forces

[14]Mackinder (1996b).

[15]Cui (2014).

applicable in the Pacific in general, and in the Western Pacific in particular."[16] Such policy actually means to create a situation in which each power will equally profit while carving up the Chinese market. And moreover, any country will definitely not meddle in other countries' affairs, because it tends to turn even the best friends into enemies.

When the world entered the Atomic Age especially the Cold War, a "balance of terror" was created as a result of nuclear deterrence and parity. The world was then convinced that a nuclear war was fully capable of "destroying" both sides, which has successfully deterred any country from launching a nuclear war and ensured world peace. However, as there was no "balance of terror" during the second world war when only the United States had nuclear weapons, no country deterred the United States from dropping atomic bombs on Japanese cities; but after the Soviet Union and China developed nuclear strike capability successively, especially the "second-strike capability", each country was convinced that the opponent's second strike would be destructive to themselves and thereby a nuclear war was surprisingly avoided.

While the United States became the only global superpower, claiming that it is their "responsibility" to maintain the world order, Zbigniew Brzezinski proposed a "grand chessboard" theory: An America-led political equilibrium. That is to say, American must make sure no challenger from any region of the world will challenge its global primacy, and therefore each country within a geopolitical region, such as Europe, the Pacific Ocean, must check each other, so that a balance of power will exist between the European Union and Russia, between China and Japan, or among Islamic countries, to ensure an America-controlled equilibrium.

As a matter of fact, not only great powers seek equilibrium, and more so, small countries also need equilibrium. Since the Second World War, nation-states became independent one after another, which has thereby caused a great increase in the number of countries. All countries managed to exist in equilibrium, and Singapore is a very good example of small countries successfully adjusting to great power game and regional equilibrium. Almost all wars and terrorism broke out as a result of "disequilibrium". It follows that the balance of power, i.e., equilibrium in geopolitical regions, is not only vital to peace and economic development, but a necessary condition to prevent economic globalization from going astray. Economic globalization is a double-edged sword, and a disequilibrium-based globalization will definitely not be a blessing for human beings.

Since the late 20th Century, the global economic center began to shift eastward, and moreover, East Asia, with China being its center, also rose as a result of the rapid change of world economic growth pattern. Not only the United States felt it very urgent to achieve "rebalance to Asia"; besides, in a new global political and economic landscape, creation of a new balance of power to sustain the sound trend of globalization was also becoming a very pressing task for the whole world. In other words, it was also very urgent for the world to work on how to achieve harmony between the structural balance of globalized market economy, balance of

[16] Mahan (1910).

interest among different stakeholders, and the balance of power in geopolitical and geo-economic regions and bring them into

We can see from a brief review of history that economic globalization is conditioned by peace and free passage in sea lanes. The countries that are in line with the interests of globalization are mostly leading industrial countries that believe it is an international duty to construct a balance of power based on national strength. In contrast, other countries didn't benefit from economic globalization and even suffered great losses: some of them were even colonized or "controlled" by great powers so that they were put at a disadvantage in the political arena; some countries were marginalized due to their unfavorable conditions in the geopolitical landscape—their economic development was severely hindered and even interrupted by warfare, and therefore they were labelled as "backward countries" and even "losers" for very long. Struggle among powers might even reduce markets to battlefields and turn economic globalization into world wars. Therefore, the success of economic globalization is highly dependent on the effectiveness of global governance structure.

8.5 The Evolution of Global Governance Structure in the Context of Globalization

As mentioned above, international institutional arrangements, i.e., global governance structure, matter more to the outcome of economic globalization. Global governance structure is an institutional choice based on national interest and strength. Economic globalization, according to economic theories, falls into economic liberalism. However, in reality, as some scholar put it, "A free-market, free-trade global economy does not just come into being. It is a choice, and it is also an imposition". "Few powerful nations have ever perceived their well-being as intimately tied to a liberal free-trade international economy and had the will and power to create and sustain it. Indeed, in the modern era of nation-states, there have only been two: Great Britain in the nineteenth century and the United States in the twentieth." Besides, only when these two countries both believe that a liberal economic order is the best way to increase their wealth and strength, they will support and promote free market and free trade for the sake of national interest. That is to say, unlike what economic theories have described, not all countries will gain full comparative advantage from economic globalization in reality. Rather, it is very likely that some countries will be severely damaged by economic globalization. A country's decision to embrace or refuse economic globalization is made out of consideration for national interest. So, "Even Britain and the United States did not always favor a free-trade system… Both nations went through long periods of protectionism before embracing free trade. But at the height of their power—Britain in the mid-nineteenth century, the United States in the twentieth—both nations stood the most to gain from open markets and free trade. Their advanced industries were dominant. Their dynamic economies benefited from the export of goods and capital. Their powerful navies controlled the seas and

dominated the trade routes, while their competitors were generally land powers that depended on them to keep the lanes open."[17]

It thus follows that economic globalization and international free trade are just in the best interests of leading industrial powers, not all countries could benefit from economic globalization and the corresponding global governance structure. So, there will inevitably be a huge gap between the ideal, i.e., market equilibrium and the reality of globalization as a result of "partial" economic globalization and global governance structure.

It is easy to understand that economic globalization always occurs in a certain institutional environment. The outcome of economic globalization tends to vary according to international institutional arrangements, i.e., global governance structure. That is to say, in different time periods, the international political/economic order, the way international economic activity is governed, norms of international economic activity, as well as rules and procedures for dispute handling tend to be different, too.

Economic globalization requires free movement of goods, fund (capital), personnel, etc. around the world, i.e., freedom in trade, investment, migration (freedom of natural person's movement across national borders), etc. in terms of policies and institutional arrangements. But in reality, all "freedom" is realized in certain geopolitical conditions, including various tough barriers and complex relations. After many years of war, European countries reached a consensus in establishing the Westphalian system[18] that recognizes national sovereignty and pluralistic co-existence, and such principle kept influencing Europe till the present day.

The Westphalian system, which recognizes that all countries, large or small, have equal power and thereby should abide by the norms of international relations, did create an equilibrium where "nobody can harm anyone else". However, it is conditioned by a balance of power or based on the premise that the balance will not change radically; besides, it also requires that each country should neither obstruct trade, investment or free movement of personnel nor seek greater "ambitions". But these premises and conditions are not invariable. So, even though the international community hasn't so far found a system that could be more widely recognized than the Westphalian system, it does not mean that the Westphalian system can ensure an everlasting world peace.

During the era of economic globalization 1.0, i.e., when the Industrial Revolution has greatly boosted productivity, countries competed with each other fiercely for more territory, larger colonies and more "sphere of influence" in order to expand global market and investment space, and such competition continued unabated until the breakout of war. So, the first wave of economic globalization is characterized

[17] Kagen (2013).

[18] After the Thirty Years' War, European countries signed a series of peace treaties in 1648, the so-called "Peace of Westphalia". The equilibrium established in Europe as a result of "Peace of Westphalia is called the Westphalia system. Although the balance of power was then not stable, it did establish the norms of international relations based on equality and sovereignty. Peace of Westphalia remained the basic way to solve conflicts and tensions between European countries in next several hundred years.

by "seizure of territory". "Until the outbreak of World War I, England acted as the balancer of the equilibrium", by "identifying the national interest with the preservation of the balance of power". When great powers or blocs are well-matched in strength, the Westphalian system can still be maintained; however, once the balance of strength changes significantly and covetous nations seeking to redistribute land and sphere of influence rise as a result of it, the Westphalian system will be replaced by wars among powers. By then, the situation will be far beyond Britain's control. Because "the balance of power can be challenged in at least two ways: The first is if a major country augments its strength to a point where it threatens to achieve hegemony. The second occurs when a heretofore-secondary state seeks to enter the ranks of the major powers and sets off a series of compensating adjustments by the other powers until a new equilibrium is established or a general conflagration takes place."[19] Even before the breakout of the First World War, the Westphalian system has already failed to deal with such challenge, which is the fundamental reason why two great world wars broke out in the era of economic globalization 1.0. That is to say, economic globalization under liberal capitalism led up to endless contention and even wars among imperial powers.

After the Second World War, the world began to reflect upon the pros and cons of economic globalization and created the "post-war order". Such order was characterized by the establishment of international organizations such as the United Nations, the International Monetary Fund, the World Bank, the World Trade Organization, respect for each country's sovereignty, the end of colonial occupation, support of nation-states seeking independence and national interests, but at the same time it also required or even forced all countries to adopt the open-door policy and free trade system. In terms of the governing logic, it is to a considerable extent a return to the Westphalian system, but they are still different from each other. The post-war order recognizes the prerogatives of great powers to maintain international rules, and it seems that the five permanent members of the UN Security Council (the United States, the Soviet Union, the UK, France and China) can have the final say on international matters. As a matter of fact, the world order was just led by the United States and the Soviet Union. It thus follows that global governance in the second wave of economic globalization, i.e., the era of economic globalization 2.0, is characterized by hegemony. Before the 1990s, the world was divided into two blocs, namely the Eastern bloc and the western bloc, under the hegemony of the Soviet Union and the United States respectively; but in the 1990s, the dissolution of the Soviet Union ushered in the era of unipolarity, i.e., American primacy, which was very rare in the history.

Believing in "American exceptionalism" and "U.S. global leadership", the United States acted as "world police" and "global leader" to ensure "freedom of navigation", which has made up for the deficiency of the Westphalian system, i.e., "toothless governance" resulting from lack of "police", but, in the meantime, has also ruined the inherent logic of Westphalian system. The United States claimed that America, with a tradition of "isolationism", was "invited" to police the world; as a matter of

[19] Kissinger (2015a).

fact, it is very much in the national interest of America to do so. America has not only placed its own interests, laws and power above other countries, but sought to promote American values (freedom, democracy, human right, etc.) all over the world as the goal of global governance, which apparently does not conform to the principle and spirit of Westphalian system, namely, inclusiveness, pluralism, and non-interference in other countries' domestic affairs. The Westphalian system aims for equilibrium and prevention of wars; while the institutional logic behind hegemony is to maintain equilibrium through power, which might lead to tense international relations and even wars. In other words, after the hegemon ruled that some countries had "broken laws", it would impose sanctions on these countries and even invade them, resulting in local wars or "proxy wars". It often occurred in both periods of unipolarity and bipolarity.

Despite the breakout of "cold wars" and conflicts in the era of globalization 2.0, huge progress has been made and an increasing number of countries have benefited from the second wave of economic globalization. In particular, some developing countries, such as China, have risen rapidly and changed the world pattern after their integration into global economy, and thereby were dubbed as "emerging economies".

According to John Naisbitt, a famous futurologist, the changing global economic balance of power is to some extent a result of economic globalization, because the world is shifting from capital nationalization to capital globalization. It might take us a very long time, but we are sure to realize global economic integration eventually.

The rise of emerging economies means the relative decline of the United States and its inadequacy in the face of global complexities. As the only hegemon and the world leader, the United States hopes to further advance economic globalization, because it is not only an "international obligation" but in its own national interest. Compared with small countries, great powers' boundaries of national strategic interest tend to be much wider, and it is particularly true of global powers, whose strategic interests almost penetrate every part of the globe. An increasing number of emerging economies are approaching the United States, which means theoretically that the American-led unipolar system has already been challenged. In the mid-20th century, the United States accounted for 1/3 to 1/2 of world GDP, but the percentage has now fallen to 1/5. Once China's GDP per capita reaches the world average, its GDP will exceed the U.S.A by a large margin. So, in the second wave of economic globalization, hegemonic intervention will inevitably "shatter" some regions' geopolitical patterns and thereby cause them to disengage from economic globalization. As a result, the situation will get more and more complex and even much harder to control. On the other hand, the relative decline of the hegemon will make it feel inadequate in the face of difficult situations. Therefore, the hegemon hopes to share burdens with emerging countries, but, in the meantime, it also fears its global leadership might be challenged or weakened. Such paradox is the crux of the structural problem hindering economic globalization from moving onto the next phase.

What deserves more attention is that in the era of economic globalization 2.0 characterized by hegemony, that is, international economic rules were mainly made by hegemons, while backward countries were put at a disadvantage, the gap between countries would inevitably widen in terms of social development. As a result, countries that are alienated from economic globalization were more inclined to find other ways and try to overthrow the Westphalian system. Disregarding national sovereignty and borders, some countries even resorted to religious extremism or even violent terrorism to resist economic globalization. Due to backward economy and the hegemon's involvement, some countries were thrown into severe political chaos after a great debacle of their governments, resulting in international refugee flows under anarchy. What is supposed to be free international movement of "natural persons" (freedom of migration) conforming to the principle of economic globalization has degenerated into unacceptable international refugee flows. Therefore, the countries most people would like to immigrate to had to take countermeasures and thereby gave rise to a social trend of anti-globalization. It can be said that a "negative legacy" that the era of economic globalization 2.0 has left behind is chaos and disorder resulting from hegemony.

Zbigniew Brzezinski, a famous American contemporary strategist and geopolitical scientist, said, "That mega-continent (Eurasia) is just too large, too populous, culturally too varied, and composed of too many historically ambitious and politically energetic states to be compliant toward even the most economically successful and politically preeminent global power (the United States)." "Unfortunately, to date, efforts to spell out a new central and worldwide objective for the United States, in the wake of the termination of the Cold War, have been one-dimensioned. They have failed to link the need to improve the human condition with the imperative of preserving the centrality of American power in world affairs."[20]

Economic globalization has hereby led to another structural disorder in terms of global governance. Henry Kissinger said, "In the world of geopolitics, the order established and proclaimed as universal by the western countries stands at a turning point. Its nostrums are understood globally, but there is no consensus about their application." Moreover, "It proves unable to accommodate a major change in power relations". A global governance structure adapting to new trends must be set up to further advance economic globalization. As Dr. Kissinger put it, "the Challenge becomes itself…the disciplining of globalization because sustainable practices imply a modification of the conventional pattern."[21]

The current reality is as follows:

(1) the United States is currently still the world leader and emerging countries wouldn't challenge U.S. leadership, however, unipolarity is becoming a thing of the past and the world also calls for emerging power leadership in global governance. So, the establishment of a "new type of major-power relationship" is the key to improving global governance.

[20] Brzezinski (1997).

[21] Kissinger (2015b).

(2) The premise for emerging powers sharing leadership responsibilities in global governance with the United States is that their power should be in line with their ever-growing national strength. A great power whose national interests are impaired would not possibly cooperate with the United States effectively, but instead, it would probably end up with conflicts with the Untied States while striving to safeguard its own national interests. It will do no good to global governance, and will not be in the interest of the United States, either. Therefore, only if the United States, as a global power, and emerging countries, as regional powers, support the remaking of a new equilibrium in the geopolitical regions that these emerging powers belong to, a new global equilibrium will probably be maintained under a new type of major-power relationship.
(3) The strength of emerging powers keeps growing, their boundaries of strategic interests keep widening, and their enterprises and citizens "go global" and try to "blend in", i.e., to integrate with overseas economy and blend into overseas society. Thus, emerging powers' national interests are more and more global, i.e., more and more overlapping with global interests, which suggests that their increasing share of international responsibilities has been more and more compatible with their duties of safeguarding their own national interests. To maintain world peace, to expand the space for economic globalization, and to enable more countries and regions, which haven't undergone economic globalization yet, to integrate with global economy are in the interests of all countries. Therefore, in the third wave of economic globalization, hegemony will be gradually replaced by multi-level governance so as to create a new equilibrium at different levels (between great powers, within a region and across the globe) as well as a new pattern for global governance characterized by inclusiveness and pluralism.

To sum up, it seems that the balance of power theory in international relations just ensures peace, but not justice, so it is often criticized for lacking morality. However, throughout the history, theories opposing equilibrium turn out far more problematic than equilibrium theory. Economic globalization needs some degree of international equilibrium, but it does not mean that international equilibrium in any form could ensure efficiency and fairness. Both the era of economic globalization 1.0 characterized by a balance of power and the era of economic globalization 2.0 characterized by hegemony have distinct deficiencies and lack morality, which means that economic globalization hasn't so far reached the ideal state. So, whether the era of economic globalization 3.0 will outdo the previous two periods, or be more just, is up to each country's future endeavors, which will put human wisdom to a tough test.

8.6 China in the Era of Economic Globalization 3.0

The most distinctive feature of the era of Economic Globalization 2.0 is that many major developing countries, particularly China, dubbed as "emerging economies", deeply integrated themselves into global economy with strong momentum of growth,

which has changed the whole landscape of economic globalization and moved economic globalization onto the next phase, i.e., the era of economic globalization 3.0. On a global scale, China is an extremely large economy but with a moderate GDP per capita, which is a typical feature of Chinese economy.

According to statistics, in the list of over 200 countries/regions, over 60 countries have already achieved industrialization and become industrial societies, whose population adds up to less than 20% of the world population; but China alone, whose population is 1.37 billion, has already made up almost 20% of the world population. That is to say, China's industrialization will double the world population of industrial societies and bring about huge changes to the world map of industrialization within decades. China's industrialization concurred with China's opening-up since the 1980 s. During the process of industrialization, China opened up widely to the outside world at a rarely high speed. Even some foreign experts from international organizations had to admit that China's opening-up plan after its entry into the World Trade Organization was "very radical" in many aspects, so it can even be said that China's opening-up is the fastest, the widest and the most radical ever in history, while its industrialization was still in the phase of low income (per capita).[22] Since the 21st century, China has integrated itself very rapidly into world economy, particularly manufacturing industry, which has been more deeply involved in international division of labor. China, which used to be a highly closed economy, has in no time become an integral part of global economy.[23]

In the era of industrialization acceleration, China's participation in the international division of labor has greatly boosted the manufacturing industry, which is a direct benefit from the "radical" policy of opening-up. The slicing up of supply chain is a result of the deepening of international division of labor in the process of industrialization. The slicing up of global supply chain will make it possible for traditional industries relocate rapidly to China from developed countries and newly industrialized countries. Thanks to international division of labor, China's manufacturing industry mainly undertakes assembly and processing, and in coastal regions and an increasing proportion of hinterland have thereby sprung up many processing zones and industrial clusters. The slicing up of supply chain is one of the important conditions of technological diffusion and industrial expansion. With the rapid slicing up of global high-tech supply chain, not only traditional industries but some components processing in high-tech industries also relocate rapidly to China.[24] As a matter of fact, with the slicing up of supply chain and refined division of labor,

[22] No country with a population of larger than 100 million has ever adopted the policy of opening-up in such an all-round way and so completely in such poor economic conditions as China, especially its high tolerance for foreign direct investment and its completely open policy.

[23] Jin (2015a).

[24] The slicing up of high-tech supply chain is more common. Take computer industry as an example, in 1981, IBM corporation made a decision of outsourcing two major PC components, namely, the operating system and the processor to Microsoft Corporation and Intel Corporation respectively, which is a milestone in the history of Information technology development, heralding the beginning of slicing up of computer supply chain. Since then, the supply chain of computer is sliced up, involving more and more countries entering the international division of labor.

there is no insurmountable gap between the technique of "high-tech" products and that of traditional industries. As a result, China's industry is soon integrated into the international division of labor.

A huge economy's integration into global economy has not only changed the basic structure of global economy, but caused all economies, especially industrial systems to be highly intertwined with each other; international division of labor and cooperation has transcended geographical and political borders, which means not only economic activity has crossed national borders, but organizational forms of economic agents have transcended nationality, too. Transnational corporations and industrial chains have thus become major carriers and realization forms of economic globalization, resulting in various phenomena of "supra-nationality", which means even property (stock) right, place of registration, location and control cannot help define the nationality.

In the era of economic globalization 3.0, economic borders are becoming increasingly blurred, many economic phenomena, such as "hybrid", "intertwinement", "symbiosis" and "transgene", are influencing the whole world more and more deeply. So, as far as "the size of economy" is concerned, its absolute national sense is declining while its relative global sense is beginning to count a lot.

Even though China's economy is huge by size, its GDP per capita is still very low. According to statistics, China's level of economic development hasn't reached the world average if calculated by per capita output and income, and therefore, China is still among the group of countries below world average level (approximately 2/3–3/4 of world average). In the list of countries/regions by GDP per capita, China currently just ranks around No. 80 (among 200 countries). Angus Madison predicted that by 2030 China's share of global GDP would increase to 23%. That is to say, from now till 2030, China's per capita output and the income level are expected to reach and even exceed the world average.[25] In this sense, China has just kicked off the journey of changing the world pattern!

The first wave of economic globalization is mainly characterized by colonialism, a shift from land power to sea power, and imperial powers' contention for more land by wielding sea power. The second wave of economic globalization is characterized by hegemony, a shift from bipolarity to unipolarity, and a combination between maritime hegemony and fragmentation of land power. By such logic, the third wave of economic globalization will be characterized by multipolarity, intertwined interests, joint governance, and deepening of industrialization by tapping deeper into the oceans and land resources.

In the era of economic globalization 1.0 and 2.0, international competitions mostly occurred between "atom-like" enterprises with definite nationality (clear property right). In the era of economic globalization 3.0, global competitions will mostly occur between "complex industrial chains" composed of enterprises of various nationalities. It is not only true of the manufacturing sector, and it is even truer of international financial services, whose "industrial chains" are more complex. All economies, especially major economies, even including rival economies, are now so caught in the

[25] Jin (2015b).

web that "an injury to one is an injury to all", in sharp contrast to traditional competitions based on a zero-sum game mindset. Those who choose to "wipe out rivals" will probably end up harming their own interests.

Take the financial crisis of 2008 as an example. After the crisis broke out, all countries had to join hands to save the market; even though it is the financial sector that caused the global crisis, taxpayers' money would have to be used to save those financial institutions that caused the trouble; some manufacturing enterprises even asked governments to save their rivals with whom they share the same suppliers, because their rivals' bankruptcy would throw their suppliers into great difficulties, which would thereby affect their own interests. This has become a very interesting phenomenon peculiar to the era of economic globalization 3.0, that is, economies (countries, regions and enterprises) are highly interdependent with their interests being intensively interwoven, which is a far cry from the past when economies had very clear interest boundaries.

Obviously, the history of great powers striving to seize more territories and hegemon(s) seeking global supremacy will not repeat due to such tendency of economic globalization. No countries especially responsible great powers want to be "occupying powers" any longer, and even the United States seeking global hegemony won't "occupy", either, not to mention China, an emerging power, which is less likely to pursue imperialism and hegemony. Shared governance will be the only way to world sustainable development as well as the right direction of economic globalization in line with China's values and national interests. The pledge that "China will never seek hegemony" made by Chinese President Xi Jinping on behalf of China is genuine and sincere, which signifies that the era of imperialism and that of hegemony have both come to an end.

Another prominent feature of the era of economic globalization 3.0 is that every country must "get their own business done" at first, and the old strategy of "resorting to external expansion to distract popular attention away from internal problems" has been outdated. In Comparison with two prior periods, globalization is much deeper in the era of 3.0. If the era of economic globalization 2.0 is said to mainly focus on expansion of geographical and industrial space under the mentalities of "whoever seizes territory will command" and "whoever occupies market will be superior", the focus of the era of economic globalization 3.0 would be "people's livelihood and well-being". By then, each country will open more to the outside world and engage in global competitions among civilizations and countries; they will compete and cooperate more deeply when commodities, capital, personnel, and information move more freely across the globe; people's livelihood and well-being will be based on globalization. "Legitimacy" of institutions will be decided by the extent to which people's livelihood is improved and whether economic and social development is inclusive and sustainable, all by the international standard. To put it simple, whether people are satisfied with or recognize them will decide the outcome of international competition in the era of economic globalization 3.0. So, if a country is considered a "role model" in state governance, such reputation will play an increasingly important role in shaping its global influence. In sharp contrast, an ill-governed country in the

midst of domestic crisis with its people being less satisfied with the government will definitely not become a world leader.

Since China is now already considered the "second largest economy", it should set a good example to the world and lead the global trend with its good governance and innovations. John Naisbitt said, "China's economic strength resulted in increasing weightage in the global community, but it is still a lightweight as an authority in the global community. Global appreciation is tightly linked to accepting or dismissing China's domestic development that, we believe, is becoming more Chinese." "In China's development, domestic considerations are always in the foreground. Nevertheless, China's further opening-up is not taking place in a vacuum, but in the context of a transformation in global relationships."[26]

In the era of economic globalization 3.0, the essence of global competition is "good governance" rather than force and hegemony. "Good governance" means to get the country's domestic business done at first, and most importantly, the country should have great innovation dynamism so that its economy can display vigor, competitiveness and creativity to the utmost. So, in the era of economic globalization 3.0 China's global status will be determined by how it shifts from a power that "boasted high-speed growth" to a one that can "lead the global trend by good governance and economic dynamism". Having conducted long-term research, Edmund Phelps, a Nobel Economics Prize laureate, found out that truly sustainable economic growth ultimately depends on the unleashing of economic dynamism, but "high dynamism in the system requires high dynamism in all its parts".[27]

The reason why the U.K. and the U.S. could ever lead world economic growth is that their economy ever displayed strong dynamism; and the reason why their economy later suffered from lackluster growth and hasn't recovered yet is also related to economic dynamism, i.e., a decline in dynamism. The most important economic issue in the 21st century is how to reignite economic dynamism or which countries can unleash dynamism, realize innovation and lead world economic growth under a new situation of economic globalization? With regard to China's high record of economic growth since 1978, Phelps pointed out, "While the world sees world-class dynamism, the Chinese discuss how to acquire the dynamism for indigenous innovation, without which they will be hard pressed to continue their fast growth." He thinks that China's understanding and intention is right. His studies indicate that China is still an "economy with low dynamism" over the past three decades, and its high-speed economic growth is just attributed to its "vibrancy" rather than "high dynamism". "While the economy is moving up to a higher place in the league tables—a partial "catch-up" to the modern economies—it will be growing at the normal, global, rate plus a transient, which fades away as the destination nears."[28]

Most economists also believe that it is highly probable that China's era of super-high economic growth would soon come to an end. At the end of 2014, Lant Pritchett

[26] Naisbitt and Naisbitt (2016).

[27] Phelps (2013a).

[28] Phelps (2013b).

and Lawrence Summers co-published an article entitled *Asiaphoria Meets Regression to the Mean*, in which he concluded, "Regression to the mean is the single most robust finding of the growth literature, and the typical degrees of regression to the mean imply substantial slowdowns in China and India relative even to the currently more cautious and less bullish forecasts. India and, even more so, China are experiencing historically unprecedented episodes of growth. China's super-rapid growth has already lasted three times longer than a typical episode and is the longest ever recorded. The ends of episodes tend to see full regression to the mean, abruptly." And the specific forecast is: "China's and Indian economic growth rate will be 3–4%."[29]

Surely, such forecast is just based on "extrapolation". "High probability" does not mean to exclude the occurrence of "low-probability" things, that is to say, it is likely that China's economy would pick up speed again when it becomes an innovative country and displays great economic dynamism after deepening reform comprehensively. It can be seen that China, in the era of economic globalization 3.0, is expected to undergo a radical transformation from being a "heavyset 'B' student" to an "dynamic 'A' student, in other words, China's level of income per capita should rise to the world high level from being below world average, which requires great dynamism to maintain a rather high speed of economic growth.

It thereby follows that China's determination to build a moderately prosperous society in all respects and in particular to win the battle against poverty by 2020 is of profound global significance. The world will be watching China more closely to see whether it could achieve clean governance, democracy and a sound legal system in a real sense? They all wait to see how the second largest world economy will convince them. Only if the world is completely convinced, will China become a global power with global persuasiveness, charisma and influence as well as strong leadership and thereby make a fundamental impact on the global governance system. Before that day comes, the whole world will still be in the US-led "post-war order", and no country can bring about any substantial changes to it. Just as Naisbitt put it, in some sense, "the great change in world economy" is essentially "the change China brings to the world". Whether China is able to do that, the key is not its strength or power, but whether its values or ideas could convince the world.

8.7 The Spirit of "Inclusiveness" in the "Belt and Road Initiative"

International strategic critic Zhenhai Qiu wrote in the preface to his book entitled *Impending Crisis On China's Periphery: Inside Story and Unexpected Turn*, "We are being increasingly needed by the world, but what the world needs is just our money. Regrettably, our heart cannot conquer the world."[30] This seems to be very depressing, but it did show the critical importance of "heart connection".

[29] Pritchett and Summers (2014).

[30] Qiu (2015).

In the era of economic globalization 3.0, it will be a basic trend to establish a more comprehensive and in-depth connectivity among more countries. The core meaning of China-proposed the "Belt and Road Initiative" is also to establish greater "connectivity" in the first place. The "Belt and Road Initiative" is proposed in response to the significant change in the post-war order and geopolitical pattern, and thereby is closely related to almost all the four geopolitical regions (also called "strategic jurisdiction") in the world map, namely, the maritime-nation region (with U.S. and coastal countries of Europe as its core), Russia-centered Eurasia, China-centered East Asia (including both land and oceans), and India-centered South Asian Subcontinent. It is no easy task to establish "connectivity" in such an extensive and complicated geopolitical space across the globe, and therefore, China must let the world know "why and what" in both words and deeds, and only by then could the world say "yes" or "no".

Throughout the world history, all the historical periods of "global connectivity" driven by the logic of land/sea power theory ever witnessed large-scale world wars. Land power theory emphasizes the concept of "sphere of influence", because, unlike "high seas", there are no particular land areas around the world that do not belong to any particular country and thereby ensure "free passage". Therefore, it would be hard to ensure global "connectivity" without "sphere of influence". Great powers' contending for more territories and larger sphere of influence is a geopolitical feature peculiar to the era of land power. Besides, land power theory was also used by Nazi Germany to justify its expansion of "living space" and aggression.

Coastal countries of Europe ever found great support from ideas of sea power theory, and even more so the United States since the 20th century. In the era of sea power, it was believed that it was sea powers' "legal" rights to "explore" and expand overseas colonies, which was even regarded as "heroic" deeds. Since the 20th century, sea powers (mainly the United States) required and forced continental countries to "open doors" to realize "connectivity" as part of their global strategy. As a result, "free trade", "free market" "freedom of navigation" in the high seas, "economic globalization", etc. became the basic concepts widely accepted by the modern world, the very concepts that the pattern of world "connectivity" and world governance order are based on. The United States, believed that it, as the only superpower, had the prerogative to safeguard the world order. Moreover, it was also recognized and accepted, voluntarily or involuntarily, by its allies and even some other countries. Some countries even "invited" the United States to serve as a "counterbalance" to Russian in Europe and to China in the Asia-pacific region.

In the era of cold war, the Soviet Union, which embraced the ideology of internationalism, counterbalanced the sea power theory by encouraging and supporting the campaign of communism across the globe, in an effort to create a soviet-union-centered sphere of influence that covers Eastern Europe, some Asian allies and even other regions and make it run "parallel" to the western capitalist world in a geopolitical and geostrategic sense. To some extent, it is also an idea of "connectivity", though based on a certain ideology. However, such "connectivity" ever led to great international tensions due to its conflict with another superpower.

It thus can be seen that, in the past, "connectivity" all meant to strengthen their countries. Only powerful countries embraced "connectivity" to implement their own strategies and most of them had "imperial" ambitions. In such circumstances, weak countries tended to close their doors and adopt conservative policies; they would rather give up "open-door" policies, free trade and economic globalization unless they feel secured. As a matter of fact, they just simply didn't welcome "connectivity". To put it in nutshell, "connectivity" is closely knitted together with each country's sense of security. No matter how lucrative a business is and how mutually beneficial it sounds, it is still hard to establish "connectivity".

From the geopolitical perspective, China, as the center of East Asia, has features of both land and sea, and therefore, the logic behind the "Belt and Road Initiative" is neither solely the "sea power" theory nor solely the concept of "land power". When China began to carry out the reform and opening-up, it accepted directly and readily many international concepts such as "free trade", "economic globalization"; however, it would be hard to make all countries accept readily and directly the concept of "global connectivity" so as to advance the "belt and road" initiative smoothly. So, here comes the biggest problem, that is, without a conceptual basis for "belt and road" initiative to ensure "conceptual connectivity", each country would not be reassured so that there would be many obstacles to "connectivity" in practice.

China is not the world's largest power, whose soft and hard power are not strong enough to make China's values widely recognized and spread across the world; China has been advocating "harmony with diversity" and respecting cultural values of different countries and nations as well as their right to self-determination, so "conceptual connectivity" required by the "Belt and Road Initiative" is not "conceptual uniformity", and other countries concerned cannot come up with any uniform concept, either. For example, China accepted "free trade" and "globalization", but some countries concerned might not accept them; China embraces the idea of "all-round opening-up", while other countries might interpret it differently. Even though their governments accept a certain concept, it will still be likely that some sectors disapprove of it; and moreover, rotation of ruling parties might also bring about changes. So, the real meaning of "conceptual connectivity" is just "conceptual compatibility", which means harmony rather than uniformity; besides, it also requires each party concerned to not only make itself clear but understand others very well; each party should tolerate as far as possible different values and concepts from other countries so as to jointly seek the greatest "common divisor". Currently, the concepts that "Belt and Road" countries/regions might accept include: reciprocal partnership, host-guest harmony, compatibility of choices.

The so-called "reciprocal partnership" refers to the cooperative partnership between Belt and Road countries/regions based on the principle of mutual benefits and multi-win. Surely, a higher-level partnership might lead to a "community with shared interests" and even a "community with a shared future", but it should be noted that it is just a partnership, neither a forced one nor an alliance. Most importantly, reciprocal partnership is neither exclusive nor linked with any geopolitical "sphere of influence", that is to say, the "Belt and Road" initiative will neither challenge the established "sphere of influence" in the geopolitical pattern, nor have the strategic

ambition to expand any country's sphere of influence; and therefore, it will not be the tool of such expansion, either. So, no matter which "sphere of influence" it falls into, whatever country joins the "Belt and Road Initiative" will benefit from the initiative, and their participation will not affect the geostrategic interests of great powers concerned, either. The recent establishment of Asian Infrastructure Investment Bank (AIIB) is a very typical example of countries transcending conventional boundaries set by "alliance" and "sphere of influence" and voluntarily participating in the "reciprocal partnership". Even the United States, as the leader of many alliances, can do nothing about it. It might also be possible that the United States will not persist in resisting AIIB, and quite the contrary, it might cooperate with AIIB and become a "partner" as well.

The so-called "host-guest harmony" refers to a healthy host-guest relationship involved in the "Belt and Road Initiative", being nothing like colonial relationship or alliance. Under this paradigm, "Belt and Road" countries are hosts, and foreign enterprises and citizens are guests. The host should treat guests with hospitality, and the guest should not bring inconvenience to the host. To treat guests with hospitality and to "do as Romans do" are the etiquette that works for every country, which therefore lays a good conceptual foundation for the realization of "connectivity". No countries will refuse such concept.

The so-called "compatibility of choices" refers to each country's respect for any other's economic order (system, law and policy) and development strategy. Economic order and development strategy vary from country to country, which is neither an inevitable result nor an imposed idea, but each country's voluntary choice. Each country tends to choose the economic order and development strategy that is in their best interest or more suitable for their actual national conditions. Besides, different countries, with different orders of priority, tend to make different strategic choices and policy arrangements. So, in order to get more countries involved in the initiative, China should respect other countries' development strategies. To sum up, China should respect other countries strategies/choices and try to understand any reasonable behavior based on the principle of self-interest. If every country concerned can help each other to fulfill their wish, the "Belt and Road Initiative" will definitely achieve great success in "connectivity" and avoid strategic conflicts and geopolitical tensions between countries concerned.

A major defect of the traditional theory on balance of power is its static nature. In an ever-changing world, the old balance tends to be upset by new forces, and a "re-balance" is thereby needed. Whether to move back to the old balance or forward to seek a new one tends to be the rooted cause of international conflicts, especially conflicts between great powers. Therefore, a sustainable balance must be a dynamic, inclusive one, that is to say, the dominant concept of "economic globalization" based on the free market economic order must be given a new meaning, i.e., "balanced development". As the largest developing country, China has the duty and capability to enrich the concept of economic globalization by adding "balanced development". So, the new concept of economic globalization will be "balanced, inclusive globalization", which will underlie the connectivity of "Belt and Road" initiative.

A "balanced, inclusive globalization" will neither conflict with the mainstream concept of economic globalization, nor disrupt the post-war international order; it will neither set up a new bloc nor challenge US primacy; but at the same time it will be capable of overcoming the deficiencies of liberal globalization, that is, imbalanced development and inequality all across the globe as well as the long-term failure to close the "North-South gap" and "core-periphery inequality". "Balanced globalization" emphasizes that globalization should benefit wider areas and more countries, especially countries whose development are quite lagged behind.

All in all, being injected the concepts of balanced development and inclusiveness, the meaning of globalization will be more enriched, encompassing both "balanced globalization" and "inclusive globalization", which will hopefully be widely accepted by "Belt and Road" countries and even other countries. In this way, it will maximally approach the human ideal of establishing a "community with shared interests", and probably make such idea more realistic and feasible, too. On the one hand, this concept can be supported by economic theories (especially development economics) and geopolitical theories and thereby hold a theoretical height; on the other, it can also command a moral high ground of human development and embody the new concept of the era of economic globalization 3.0 as well.

Peiyan Zeng, chairman of China Center for International Economic Exchanges and former vice premier of the State Council of the People's Republic of China, pointed out, "Currently, world economy is undergoing great changes and adjustment, whether in terms of pattern, order or rules. And this is true of China, an open and responsible emerging power in the world. I believe that it is far from enough to boil down China's reform today just to "transformation". The "new normal" of China's economy manifested itself in a variety of aspects, including growth rate change, the switching of economic growth engines, optimization of economic structure, adjustment of means of resource allocation, changes in government administrative behavior, and national welfare being shared by all." "Currently, China has grown from a regional power into a global power; many major strategic moves made by China, such as the "Belt and Road Initiative", inclusion of the Yuan currency in the Special Drawing Rights, an active participation in the reconstruction of multilateral international trade rules and efforts to promote the reconstruction of global value chains, signify that China has integrated itself deeply into global economy." "In future, China is expected to benefit maximally from international macro-economic policy coordination and cooperation in terms of rule-making, policy communication, global governance, etc."[31]

Combination of the Industrial Revolution with market economy ushered in the era of modernization, which would inevitably increase the momentum of globalization. Economic globalization requires each country or region to open markets to promote integration of world markets. Unfolding in different geo-relations and world orders, economic globalization went through three stages. In the first stage, imperial powers contended with each other for more overseas colonies and larger sphere of influence; in the second stage, sovereign countries opened their markets and accepted the world

[31] Zeng (2016).

order led by hegemon(s), which assumed the role of maintaining global trade and freedom of global navigation. At present, economic globalization is advancing deeper into Eurasia and southern countries. The world is to enter the third stage of economic globalization characterized by global prosperity and a new world order under a new balance of power. Amidst growing momentum for world integration, China put forward the "Belt and Road Initiative" and called for the establishment of a "new type of major-power relationship", which will inject new vigor and add more power to globalization, enabling the countries concerned to be more competitive.

In the era of economic globalization 3.0, a more inclusive and balanced world economy will be in the interest of most countries, though conflict of interest will inevitably arise as a result of intertwining interests. Especially for global powers, whose interest boundaries have extended all over the world, to maintain a new balance of economic globalization is in line with each country's national interests. So, in the era of economic globalization 3.0, when intricate interest entanglements and conflicts are inevitable, deep structural changes will bring about an overlap of interests among major global competitors, the ever-deepening of "symbiosis" and "parasitic relations", and an objective tendency of the world becoming a "community of shared interests". An era of global economic integration is beaming to us; by then, competitions will be more friendly (less reliant on military hegemony) and the world will be more harmonious.

References

Brzezinski, Z. (1997). *Grand chessboard: American primacy and its geostrategic imperatives* (p. 35, 214). New York: Basic Books.

Cao, Z. X., & Gao, G. L. (2015). The connotation of and policy recommendation for overall planning development of land and sea in China, *China Soft Science,* (2), 1–12.

Chen, W. L. (2015). Promoting hand in hand the construction of the Belt and Road Initiative for a more beautiful future. *Globalization, 6,* 5–29.

Cui, S. J. (2014). Expert's guide to the book. In: Mackinder, H. J. (trans. Qu-yang, Jin) *Democratic ideals and reality* (p. 5). Beijing: Petroleum Industry Press.

Fromm, B. (2002). *The Sane society* (p. 89). London & New York: Routledge.

Harari, Y. N. (2014). *Sapiens: A brief history of humankind* (p. 376). Random House.

Hobsbawm, E. (1987). *The age of empire: 1875–1914* (p. 41, 62). New York: Vintage Books.

Jin, B. (2015a). *Backbone of great power: Reflections upon the course of China's industrialization within the past 65 years* (p. 91). Guangzhou: Guangdong Economic Publishing House.

Jin, B. (2015b). The strategic thinking of regional economy development under the New Normal. *Regional Economic Review, 3,* 5–10.

Kagen, R. (2013). *The world America made* (pp. 37–39). New York: Vintage Books.

Kissinger, H. (2015a). *World order* (pp. 32–33). New York: Penguin Books.

Kissinger, H. (2015b). *World order.* (p. 364, 366, 369). New York: Penguin Books.

Mackinder, H. (1996b). *Democratic ideals and reality* (pp. 126–127). Washington: National Defense University Press.

Mackinder, H. (2004). The geographical pivot of history (1904). *The Geographical Journal, 170*(4), 298–321.

Mackinder, H. (1996a). *Democratic ideals and reality*, Washington: National Defense University Press, p. 106, p. 120.

Mahan, A. (1910). *The interest of American in international conditions* (pp. 144–145, 189–190). London: Sampson Low, Marston & Co.
Marx, K. (1848, January 9). *On the question of free trade*. https://www.marxists.org/archive/marx/works/1848/free-trade/index.htm
Marx, K. (1853). *Revolution in China and in Europe*. https://www.marxists.org/archive/marx/works/1853/06/14.htm.
Marx, K., & Engels, F. (1848). *Manifesto of the communist party*. https://www.marxists.org/archive/marx/works/1848/communist-manifesto/.
Naisbitt, J., & Naisbitt, D. (2016). *Global game change: How the global southern belt will reshape our world* (p. 127, 152). Sage Publications India.
Phelps, E. (2013a). *Mass flourishing: How grass roots innovation created jobs, challenge, and change* (p. 29). New Jersey: Princeton University Press.
Phelps, Ed. (2013b). *Mass flourishing: How grass roots innovation created jobs, challenge, and change* (pp. 21–22). New Jersey: Princeton University Press.
Pritchett, L., & Summers, L. (2014). *Asiaphoria meets regression to the mean*. Asia Economic Policy Conference Paper.
Qiu, Z. H. (2015). *Impending crisis on China's periphery: Inside story and unexpected turn* (p. 2), Oriental Publishing House.
The Group of Lisbon. (1995). *Limits to competition* (p. 63). Cambridge, MA: MIT Press.
Wiener, M. (2004). *English culture and the decline of the industrial spirit, 1850–1980* (2nd ed., p. 88). Cambridge: Cambridge University Press.
Zeng, P. Y. (2016). New ways to explore in macro-control under the New Normal. *China's Economy. Globalization, 2,* 5–7.

Appendix
Milestones in China's Industrialization

China's industrialization is a glorious history of the great Chinese nation's arduous efforts as well as a zigzag journey of exploration. Whatever comments are made on China's path to industrialization since the founding of the People's Republic of China, many big events during the process can be well written into the world history of industrialization as very brilliant chapters. They will be an integral part of "Chinese story".

Foundation Period

Confiscation of bureaucratic capital. Prior to the founding of the People's Republic of China (PRC), there were a considerable number of bureaucratic capitalistic enterprises, which can mainly be divided into three major types, namely, private capital owned by bureaucrats, state capital managed by bureaucrats, and other private capital controlled by bureaucrats. The embryonic forms of China's bureaucratic capital are government-run military and civil enterprises, government-supervised merchant undertakings and joint government and merchant enterprises. Afterwards, Beiyang Government also established some government-run enterprises with foreign debts. But the "bureaucratic capital" in modern historical literature mainly refers to businesses set up by Chinese Kuomintang and the national government as well as enterprises owned or controlled by government bureaucrats. What accounts for the bulk of such bureaucratic capital are enterprises and property left behind in China by imperial powers such as Japan, Germany and Italy and taken over by the KMT government after the victory of anti-Japanese war. Before the founding of PRC, bureaucratic capital, which roughly accounted for two thirds of total industrial capital, monopolized the economic lifeline of the whole country. It made up approximately 80% of total fixed assets of industrial mining and transportation industries, 90% of national steel output, and 67% of electricity generation capacity; besides, the biggest bank in China and dozens of monopoly trading companies were also run by bureaucratic capital.

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Proclamation of the Chinese People's Liberation Army issued on April 25th, 1949 prescribed that all enterprises "operated by the reactionary Kuomintang government and the big bureaucrats shall be taken over by the People's Government". Thereafter, bureaucratic capital enterprises and organizations were gradually confiscated during the process of national liberation. After the People's Government completely took over these enterprises and organizations, they would usually start with supervision of production, and then undertake to transform them gradually in order to adjust and reorganize enterprises. As a result, it had received smoothly all bureaucratic capital enterprises and organizations. By the end of 1949, it had received 2,858 bureaucratic capital industrial enterprises and already had 750,000 production workers. The confiscated financial bodies are the Central Bank, China's Bank, Bank of Communications, Farmers Bank of China, Central Trust Bureau and China Post Savings and Remittance Bureau; besides, over 2400 government-run banks all over the country were also confiscated. Railway, highway, shipping, post and telecommunications enterprises run by bureaucratic capital were also nationalized successively. In January 1951, the central government released *Rules on Disposal of Shares and Property Controlled by Kuomintang Government and Big Bureaucrats from Enterprises*, having thereby cleared and confiscated bureaucratic capital hidden in private enterprises.

After confiscation of all bureaucratic capital, the people's government established the socialist state economy and controlled the biggest banks in China, almost all railways, a great bulk of steel and iron industry, other major heavy industries and some light industries, which has therefore determined the dominant role of socialist state economy and made it control the lifeline of national economy as well. Besides, it has also laid a great foundation for the establishment of socialist planned economy afterwards.

Just within three years since the founding of the People's Republic of China in 1949, great traumas created by the war were almost completely healed in the era of national economic recovery, and thereafter, China entered the era of construction boom. Since China made and carried out the first Five-Year Plan (1953–1957), it has for the first time made many significant achievements in the history of China's industrial development. Since then, China adopted the "import substitution" strategy prioritizing heavy industry, and 156 assistance projects funded by the former Soviet Union and Eastern European countries gave a huge boost to China's industrial development and prepared the ground for China's modern industrialization. By then, China's industrial economic system began to take shape.

To look back, the then industrial system and the road to industrialization characterized by China's desperation to develop planned economy and direct participation of governments in economic activity might not be very right in terms of the guiding ideology of industrial development. However, as China was then still in the primary stage of industrialization, the state government must play an important role in starting up and promoting economic development to prepare the ground for future industrial development. On the other hand, the then economic plans were largely realistic, the national economic structure was quite simple, and state planning was relatively easy to handle. So, in the period of the first Five-Year Plan (1953–1957), China made

very remarkable economic achievements, especially in industry; besides, China had basically completed socialist transformation of capitalist industry and commerce in this period.

Socialist transformation of capitalist industry and commerce. Since the founding of the People's Republic of China, the Communist Party of China, based on its knowledge of transition to socialist society, launched the campaign of socialist transformation in agriculture, handicraft industry, and capitalist industry and commerce, known as "three transformations" campaign. Transformation of capitalist industry and commerce was then the key aspect. In June 1953, the Central Committee of the CPC drafted the *guiding principals toward capitalist industry and commerce in terms of utilization, restriction and transformation,* based on the survey conducted by the united front work department. In that September, Zedong Mao held a discussion with some representatives of democratic parties and businesses, pointing out that state capitalism, the only way to transformation of capitalist industry and commerce, has greatly promoted the process of such transformation.

By the end of 1954, most major private industrial enterprises had turned into joint state-private enterprises. In the second half of 1955, many medium and large cities began to see a trend of the whole capitalist industry and commerce being turned into joint state-private ownership. By then, the rise of agricultural cooperative movement had cut off the links between capitalism and the rural area, China's economy had begun to make a transition to planned economy, state planning body had already controlled the lifeline of the national economy and major supply and marketing channels. As a matter of fact, it had then already become an inevitable trend to turn the whole capitalist industry and commerce into joint state-private ownership and include it in the system of planned economy.

On January 10th, 1956, Beijing firstly announced its realization of joint state-private ownership of whole industries. On its heels, many major cities including Shanghai, Tianjin, Guangzhou, Wuhan, Xi'an, Chongqing, Shenyang and over 50 medium cities realized joint ownership of whole industries successively. At the end of the first quarter of 1956, 99% private industry and 85% private commerce had realized joint ownership, which means socialist transformation of capitalist ownership had been basically completed. When the transformation was in full swing, some arrangements had been made to ensure suffrage, work and life of national bourgeois industrialists and merchants, so that they would accept the socialist transformation "not too reluctantly". While reflecting upon the history of this period, the academia and even the party and government also recognized that "there was also too much haste, speed and unthoroughness in the wave of transformation of capitalist industry and commerce". In the same period, China carried out and finished the socialist transformation of agriculture and handicraft industry, too. In consequence, public ownership of the means of production had been realized in the bulk of China's economy.

The establishment of planned economy on the basis of public ownership of means of production. Fromthe completion of socialist transformation till 1978 when China began to carry out opening-up, the following structure of ownership in China's industry had been basically created:

First, enterprises owned by the whole people, including state-run enterprises and local state-run enterprises. Advanced and large-scale industrial enterprises usually fall into this category, and state-run enterprises are usually superior to local ones.

Second, collectively owned enterprises, including enterprises collectively owned by workers of whole industries in certain area (mainly cities), which are generally called "large collective" enterprises and enterprises exclusively owned by their own workers, which were usually called "small collective" enterprises (which later also included a small number of workers in other communities, such as collective ownership by workers from city neighborhood community). Because the management system of "large collective" enterprises was very close to that of state-owned enterprises, and their leaders (factory managers) were also directly appointed by governments, such enterprises were also called the "secondary state-run" enterprises.

Third, enterprises owned and run by people's communes and production brigades in rural areas, which were called "commune and brigade run enterprises". Later, people's commune was called township government, and accordingly "commune and brigade run enterprises" became township and village enterprises, production brigades were turned into village governments and enterprises run by them became village government-run enterprises, too. Enterprises owned by the whole people (state-run enterprises) , collectively owned enterprises, urban industrial enterprises, and rural commune and brigade enterprises, i.e., township and enterprise enterprises all played an important role in the process of China's industrialization. This is an important characteristic that sets China's industrialization apart from other socialist countries' planned economy. At that time, public ownership of means of production was a necessary institutional condition for China's socialist planned economy, because mandatory plans could only be targeted at public-owned enterprises, that is to say, the state planning body could only instruct public-owned enterprises to produce and exchange goods as required by state plans. Only in this way can "planned, balanced, proportionate development of the national economy" be ensured, and in the mean time, "anarchy" and economic crisis peculiar to capitalist market economy be avoided, too.

The second Five-year Plan period (1958–1961), the Central Committee proposed a three-fold guiding principle for economic development. To be more specific, China established the general line of "going all out and aiming high, more, faster, better and cheaper to build socialism", to "catch up with the U.S. and surpass the UK" in terms of industrial development, and set up the system of people's commune in rural areas and even aimed to make it extend to urban areas. All thereby plunged the country into a frenzy of industrial activity. For example, under the slogan of "dare to think, dare to act", China launched a "backyard steel campaign" all over the country and encouraged the whole industry to use indigenous methods for production.

The period of national economic readjustment (1963–1965). Many factories and mines were closed; a large number of workers went back to their hometown. However, due to the fact that China's economy has great resilience, and that planned economy, owing to its peculiar ideology and management method, has its special way of mobilizing resources, special principle of public and collective interests overriding individual interests and special function of dealing with non-regular crisis, China's

pace of economic development did drop to a reasonable level and its economy had basically recovered. Objectively speaking, such campaign did create some industrial enterprises and train some workers. A considerable number of such enterprises survived and out of practice (even including failures) were molded many competent workers (especially technical workers), who had later become the hardcore and potential workforce for industrial development all over the country.

From 1966 to 1976, such period of time did witness some industrial achievements. Viewed from historical facts, China had never truly achieved soviet-style planned economy, but the ideal of planned economy were more and more deeply rooted in people's minds. China had to make economic adjustment by "taking enough backward steps" in the face of extreme economic difficulties, which, however, failed to discourage people from building planned economy or make people realize the impracticability of planned economy; just to the contrary, people attributed economic recovery to planned economy. Therefore, instead of learning a valuable lesson from historical setbacks, China jumped to the conclusion that it must abandon capitalism completely, and reject any market behavior and anything related to market economy.

In the mid and late 1960s, China pursued the policy of "promoting both revolution and production" in industrial development and used "revolutionary" means to mobilize and control economic development. Through political zeal and political means, China did make considerable economic achievements. For example, China had succeeded in building petroleum industry, especially in Daqing Oilfield and removed the label of "oil-poor country"; China had also completed many major construction projects, including railway, water conservancy, and Nanjing Yangtze River Bridge. In a statistical sense, it seemed that "China had already established a relatively complete industrial economic system"; and the long-established economic policy of "giving priority to heavy industry" did pave the way for future industrial development. However, China's industry was far less competitive compared with developed countries, and the gap was even widening. In particular, the great majority of Chinese people hadn't benefited from industrial civilization at all, China was still extremely poor and backward, and Chinese people's living conditions were at a rather low level. Therefore, people at that time all dreamed of achieving industrialization and modernization as soon as possible. But China still ended up going astray in the 1960s despite the fact that China had already set the right goal of realizing four modernizations, i.e., agricultural modernization, industrial modernization, defense modernization and scientific and technological modernization.

Construction of the third-tier area. China made a political decision in the face of deteriorating international situations (from 1964 till the end of 1970s) (mainly because of Sino-Soviet split), that is, to launch a large-scale campaign of infrastructure construction in 13 provinces and autonomous regions in the Midwest in fields of defense, science and technology, industry and transportation, with war preparedness as the guiding ideology. It is called 'construction of the third-tier area". The so-called "three tiers" refers to the three lines dividing the area ranging from coastal frontier regions to the inland. The "first-tier area" refers to the frontline regions along the border and coast; the "second-tier area" refers to Anhui province, Jiangxi province, and half of the eastern parts of Hebei, Henan, Hubei, and Hunan provinces between the

first-frontier region and the Beijing-Guangzhou railway; the "third-tier area" refers to the vast area in the south of the Great Wall, in the north of Shaoguan, Guangdong province and in the north of Wushao Mountain, Gansu province, mainly including Sichuan province (including Chongqing), Guizhou province, Yunnan province, Shanxi province, Gansu province, Ningxia province, Qinghai province and part of Shanxi, Hebei, Henan, Hunan, Hubei, Guangxi, Guangdong provinces. Three southwestern provinces, namely, Sichuan, Guizhou, and Yunnan and four northwestern provinces, namely, Shanxi, Gansu, Ningxia, Qinghai are usually called the "large third-tier area", while the hinterlands of the first-tier and second-tier areas are usually called the "lesser third-tier area".

According to rough administrative division, the first-tier area includes Beijing, Shanghai, Tianjin, Heilongjiang province, Jilin province, Liaoning province, Inner Mongolia autonomous region, Shandong province, Jiangsu province, Zhejiang province, Fujian province, Guangdong province, Xinjiang Uyghur autonomous region, Tibetan autonomous region. The third-tier area includes Sichuan province (including Chongqing), Guizhou province, Yunnan province, Shanxi province, Gansu province, Ningxia province, Qinghai province and the hinterland of Shanxi province, Hebei province, Henan province, Hunan province, Hubei province and Guangxi province, which involves 13 provinces in total. And the area between the first-tier area and the third-tier area is the second-tier area.

The third-tier area construction is an extremely large-scale industry transfer in China's economic history. According to historical records, in the period from 1964 to 1980 when three five-year plans had been completed, the country had invested 205.268 billion RMB in 13 third-tier provinces and autonomous regions in the Midwest, accounting for over 40% of total national investment at that time. To answer the political call of "being prepared for war and natural disasters and doing everything for the people" and "encouraging healthy and competent workforce to go to the third-tier regions", 4 million workers, officials, intellectuals, PLA soldiers and tens of millions of migrant workers all migrated from developed cities to the deep valleys, deserts, and the vast wild land, living rough and working in tough conditions. They poured their blood, sweat and tears into Midwest construction, some of whom even laid down their lives, and successfully built more than 1100 large and medium-sized industrial and mining enterprises, R&D institutions, and institutions of higher education.

Even though the third-tier regions were very backward economically, and that business relocation, production and operation there had met with many great setbacks, construction of the third-tier area had to some extent contributed to industrialization in central and western China. Construction of the third-tier area wasn't put to an end until the mid 1970s when tension in international relations was eased and China's basic understanding of the underlying trend of global times changed, that is, China had by then come to realize that the theme of the times had changed from revolution and war to peace and development.

The campaign of "Learning from Daqing". In this period, another milestone of China's industrial development is the campaign of "learning from Daqing". After people's arduous work within over three years, exploration and construction of

Daqing Oilfield, lying in the Songliao basin of northeast China, was completed, so that the days when Chinese people must rely on foreign oil finally came to an end. On February 5th, 1964, the Central Committee made an announcement that the whole nation should learn from Daqing Oilfield and carry forward "the spirit of Daqing", namely, the spirit of "enduring hardship and standing hard work" and the selfless working style. "Ironman" Wang Jinxi, model worker of Daqing Oilfield, won great admiration and respect for his devotion to the oilfield and the whole industry and transportation industry were all inspired to study the "Spirit of Daqing". Wang jinxi's famous words, "I would give up 20 years of life so China can produce oil on its own land", marked the spirit of hard work of that age!

In the first plenary session of the 3rd CPC Central Committee (from December 21st 1964 to January 4th 1965), Premier Zhou Enlai summed up great experience of Daqing Oilfield in the "Government Work Report" and issued the call of "learning from *Daqing* (in industry)", "learning from *Dazhai* (in agriculture)" and "the whole nation learning from PLA". Afterwards, a great campaign of "learning from Daqing" sprang up in the field of industry and transportation across the country, and Daqing also became a banner of China's industry. It is a hallmark event pushing forward industrialization through political mobilization and it didn't end until the end of the 1970s.

From 1966 to 1976, "learning from Daqing" became the point at issue in the industrial field: Daqing experience and "learning from Daqing" were all politicized, and the alternate struggle of approving and denying Daqing Experience went on and on. A meeting of "the whole industry learning from Daqing" was convened from April 20th to May 13th in 1977. This meeting reaffirmed the achievements and good experience of Daqing Oilfield as well as the role and significance of the campaign of "learning from Daqing". Besides, it also pointed out the tendency of boasting and rash advances. Since the third plenary session of the 11th CPC Central Committee in 1978, various advanced models and experience sprang up in new situations, and therefore Daqing was no longer the only model. Besides, Daqing Oilfield also needed to reform and open up to meet new challenges while inheriting and carrying forward their good traditions.

"Two Bombs and One Satellite" (atomic bomb, hydrogen bomb, and artificial satellite). In this period (from the 1960s to the early 1970s), a huge contribution made by China's science and technology industry is the success of "two bombs and one satellite" project. On October 16th, 1964, China's first atomic bomb exploded successfully; on June 17th 1967, the first hydrogen bomb exploded successfully; and on April 24th 1970, the first artificial satellite (Dong Fang Hong 1) was launched successfully. They are landmark events of extremely far-reaching influence, which have inestimable significance for the establishment of China's international status, influence and right to speak.

Period of Industrialization Acceleration

Emancipation of the mind and the reform and opening-up. In 1976 China embarked on a great journey of emancipating the mind. Starkly different from the past, this campaign of "emancipating the mind" did not start from the ideological ideal, but instead aimed to solve the most realistic economic and social problems and seek truth from facts. In order to "emancipate the mind", China must recognize that "practice is the sole criterion for testing truth" and that it would be in the "primary stage of socialism" for long. And therefore, the conclusion will be inevitably drawn that "the contradiction between the ever-growing material and cultural needs of the people and the low level of production would be the basic one for Chinese society." Poverty is the biggest enemy and creation of wealth is the most urgent task. Therefore, to make economic development the central task became the only right choice for China at that time.

The year of 1978 is the first year of China's reform and opening-up, which is generally considered the historical watershed in China's path to industrialization. The first encounter between new ideas and old system started in the rural area. Just within a few years, the rural reform had achieved remarkable results and served as a great stimulus and enlightenment for industrial reform, that is, China at first must try to break from planned economy, which is the very embryonic idea of industrial reform.

In 1981, the Sixth Plenary Session of the 11th CPC Central Committee affirmed that "our socialist system is still in the primary stage", which therefore justified China's then attempts to break from the system of planned economy. In 1982, the Party's 12th National Congress proposed to carry out the principle of "planned economy in the main and market regulation as the supplement", opening a gap for market economy in the system of planned economy. In 1984, the main battlefield of economic reform switched from the rural area to cities, and industrial reform (reform on enterprises) became the focus of reform. Starting from industrial field, the economic reform had managed to break all taboos of planned economy one after another. Even though many problems and chaos arose as a result of most reform measures' dual features (having features of both "market" and "planning"), market economy elements did grow tenaciously out of the system of planned economy.

In the 1980s, China began to carry out reform and opening-up, which is actually to break from the long-established system during the past three decades, so it is actually a very tough journey. Whether it is SOE reform, i.e., the key link of economic restructuring in cities, or tenacious growth of township industrial enterprises breaking through the system of planned economy in rural areas; whether it is the gradual loosening of control over foreign trade, or the practice of allowing and encouraging foreign investment, a major strategic move to break from planned economy and to explore the path of reform, they all managed to open gaps one after another in the old system. In particular, bold policies to allow and encourage some people and regions to get rich first and major moves to open gaps in the old system of planned economy through preferential policies and special economic zones (economic development

zones, etc.) did shake the very foundations of the old and rigid system of planned economy.

The breakthrough in emancipation of the mind is to recognize the legitimacy of seeking private wealth (individuals and enterprises) and to use private income and wealth as an incentive to drive economic growth. It will surely lead to reflections upon planned economy. In 1992, the 14th National Congress of the CPC officially stated, "economic restructure aims to establish and improve the system of socialist market economy while public ownership and distribution according to work are in the mainstay and other kinds of ownership and distribution serve as a supplement". It is from that time on that China's industrialization had truly begun to change its course onto market economy.

Establishment ofspecial economic zonesand open economic zones, a major move to promote the reform and opening-up. Many special economic zones including Shenzhen (2020 km^2), Zhuhai (1687.8 square kilometer), Xiamen (1565 km^2), Shantou (2064 km^2) ever played a key role in attracting foreign investment and technology, developing foreign trade and making breakthroughs in the structural reform In April 1988, Hainan was made a separate province and was made the largest special economic zone around the same time. Aside from special economic zones, the government also approved of the opening-up of many coastal cities. In 1984, the State Council firstly approved of the opening-up of 14 cities, namely, Dalian, Qinhuangdao, Tianjin, Yantai, Qingdao, Lianyungang, Nantong, Shanghai, Ningbo, Wenzhou, Fuzhou, Guangzhou, Zhanjiang, Beihai. Afterwards, Yangtze River Delta, Pearl River Delta, Xiamen - Zhangzhou and Quanzhou Fujian delta region, Liaodong peninsula, and Jiaodong peninsula were made open coastal economic zones. These special economic zones, open cities and open economic zones have become important economic growth poles in the period of industrialization acceleration. Under such policy, i.e., promotion of reform and opening-up through special policies, the central government and provincial governments (autonomous regions) also approved of building "high-tech development zones", "economic development zones", "reform pilot zones", etc. (at both "state-level" and "provincial-level").

Once made a market economy, China began to undergo dramatic changes in the economic field. Market economy is strongly capable of liberating the productive forces. By 1997, China had basically overcome the "shortage" problem, a byproduct of planned economy that has been bothering China for the past three decades. More and more products thereby moved from "seller's market" to "buyer's market", even resulting in overproduction as well as economic growth being constrained by demand, which are both typical phenomena of market economy. In this sense, the year of 1997 marked the end of shortage economy, which means China's era of planned economy will be forever gone, and market economy has gradually come to the fore. During the transition from planned economy to market economy, China's industry maintained a steady but fast growth; but, in the meantime, the reform also cost industrial enterprises (mainly SOEs) very dearly. Compared with other sectors, the reform in the sector of industry is carried out the most boldly and thoroughly and involves the most cutting-edge technologies as well.

The reform of industrial development mechanism has turned industrial growth into a strong engine for China's economic and social development. From 1978 to 2008, the average annual industrial growth rate remained as high as 11.98% so that China can maintain the annual GDP growth rate at 9.60%. China's industry has fully grown and formed an extensive industrial production chain, ranging from industrial product manufacturing to extractive industry, energy raw material industry and equipment manufacturing, which has vigorously promoted the process of China's economic modernization. Within just three decades, China has already achieved the same industrial growth and structural change as the old industrial countries did, but it took the latter almost two to three centuries to achieve that. This period is a "golden time" of China's economy, during which it has achieved a sustainable, high-speed growth.

Integration into global economy and high-speed economic growth. Entering the 21st century, China's industry has made great strides forward to achieve economic globalization. The year of 2001 can be called the "first year of China's economic globalization", because it is in this particular year that China began to fully accept the principle of free trade and international investment required by economic globalization with a view to fully integrating into the global economy since its entry into the World Trade Organization. The basic feature of China's modern economic development is that it keeps advancing along the path of world industrialization. It will be neither possible for China to skip all major stages of world industrialization nor likely to find a totally different industrial technical path to set itself apart from western advanced countries. As a matter of fact, China's economic development is generally based on technology imitation, diffusion and extension from world industrialization as well as technological innovations on the basis of the first three. On the other hand, China's industrialization is also a very unique phenomenon.

Mainly characterized by high industrial growth, China's economic development is rather "condensed" and "rapid". That is to say, just within several decades, China's industrial production capacity and economy has grown significantly. Words like "surpass", "upgrade", "leap", "transcend", "new phase" have suddenly become buzzwords. China, a major developing country, has established a very complete industrial structure after several decades' high-speed economic growth, especially the rapid expansion of industrial production; and moreover, China's industrial structure is approaching very rapidly that of major industrial powers since the reform and opening-up. Therefore, China should not only continue to develop labor-intensive industries but step up efforts to upgrade the industrial structure as well. Only thus can China be a match for developed countries in terms of capital-intensive industries and high-tech industries.

During this period, China made many far-reaching strategic plans for regional economic development, namely, Western Development Program, Rise of Central China Plan, and Northeast Area Revitalization Plan, Midwestern China. Due to these plans, the economic growth rate of both Central and Western China was even catching up and surpassing that of Eastern China, which is relatively developed, each region's level of industrial development was thereby improved, and the momentum of hyper industrial growth nationwide kept unabated, too.

Period of "New Normal"

Moving forward in a steady pace. The year of 2008 is an epoch-making year in the world economic development history, and the several years afterward (including this year) are also an important historical turning point. From 2007 to 2009, the international financial crisis triggered by the U.S. subprime mortgage crisis put an end to the "golden period" of economic growth since the 21st century (which is usually considered to begin from 2002 and end in 2007). In order to fight against the financial crisis, the governments of major countries (the central bank) joined hands to provide economic stimulus to curb free fall in economic growth and they did achieve some good results. China's extremely strong economic stimulus, dubbed as "4 trillion RMB investment" did prove effective in the short term, but its industrial economic growth rate has decreased dramatically since 2010, from the nearly two-digit growth rate all the way down to below 7% in 2016. Most economists and international organizations predicted that from 2016 to 2020, China's economic growth would continue to fall, because the potential economic growth rate would be less than 6%. China's economic development has substantially entered a new phase. "A step downward" in economic growth rate is an objective necessity as well as a basic feature of the "New Normal" of China's economic development. Since then, China will not be obsessed with high growth but seek to "move forward in a steady pace" and regard it as the basic policy of stimulating economic growth.

As a matter of fact, during the Eleventh Five-year Plan (2006–2010) and the Twelfth Five-Year Plan (2011–2015), China's uncoordinated, imbalanced, and unsustainable development has already emerged and attracted great attention. In the face of these problems, the Central Committee proposed and established the Scientific Outlook on Development[1], that is, "a comprehensive, coordinated, and sustainable development that puts people first". However, it is not easy to shift gear from extensive high-speed growth to a new growth mode, for China's economy has been growing extensively for over 20 years and such mode of industrialization would still have great inertia. So, such transition will inevitably meet with resistance and run into great difficulties. And moreover, the concurrence of "gear-shifting of growth speed", "labor pains of structural adjustment" and "digestion of earlier-stage stimulus policies" and many deep-rooted problems have made things more complicated now.

Besides, since the breakout of international financial crisis in 2008, major countries and regions of the world are all recovering rather slowly, which indicates that world economy has also entered a period of adjustment and it might last long (many

[1]Hu Jintao, former general secretary of the Central Committee of the CPC, proposed in 2003 the Scientific Outlook on Development, that is, "we must strive for scientific development by putting people first and making it comprehensive, balanced and sustainable in order to promote all-round economic, social and human development", and try to promote the reform and development of all aspects under the requirements of "balancing urban and rural development, development among regions, economic and social development, relations between man and nature, and domestic development and opening to the outside world". In 2007, the 17th National Congress of the CPC included the Scientific Outlook on Development in the communist party constitution; in 2012, the 18th National Congress of the CPC included it in the guiding ideology of the communist party.

economists believe that world economy is in the descending phase of long cycle and it will last for nearly 20 years). Therefore, it will be hard for China, an integral part of world economy, to regain the high speed like before. In the face of new domestic and international situations, China cannot rely mainly on mass export of cheap industrial products to stimulate industrial growth any more; rather, it must change gear to a new growth mode so as to strike a balance between consumption, investment and export.

High-speed railway network construction. While fighting against the financial crisis, China increased investment in infrastructure construction, which has not only stimulated the industrial growth but laid a solid foundation for long-term economic development. Its high-speed rail technology has reached the world advanced level and therefore has become China's "business card abroad". On August 1st, 2007, Beijing-Tianjin inter-city railway, China's first 350 km/h high-speed railway, was opened, and since then the construction of high-speed rail developed rapidly in the mainland. According to the plans on national railway network, China should speed up the construction of high-speed railway mainly consisting of "four transverse and longitudinal express railways" in an all-round way. A group of world-level high-speed rail designed to run at the speed of 350 km/h, such as Beijing-Tianjin inter-city railway, Shanghai-Nanning high-speed railway, Beijing-Shanghai high-speed railway, Beijing-Guangzhou high-speed railway, Ha'erbin-Dalian high-speed railway, have been completed successively, and a rather complete system of high-speed rail technology has since then been established.

Afterwards, more and more high-speed railways began to operate, such as Nanning-Hangzhou, Hangzhou-Ningbo, Tianjin-Qinhuangdao, Xiamen-Shenzhen, Xi'an-Baoji high-speed railways. At the same time, through introduction, digestion, absorption and re-innovation, China has mastered 200–250 km/h CRH trains manufacturing technology, successfully built the technological platform of 350 km/h CRH trains, and developed and produced CRH380, a new generation of high-speed train. In 2015, China's high-speed railway has covered over 18,000 kilometers (high-speed rail network covers over 40,000 km and railway 120,000 km in total). So far China has the longest high-speed railway in operation (accounting for 60% of world railway) as well as the largest scale of construction in the world.

Supply-side structural reform and new development concept. In order to resolve deep institutional problems and prominent structural problems in new situations, the Central Committee has made drastic changes to its economic policies. In the second half year of 2015, the Central Committee stated clearly, "China should pay more attention to supply-side structural reform in order to stabilize economic growth". In addition, it also emphasized that it is "a great innovation of accommodating to and leading the new normal of economic development, an involuntary choice of adapting to the new situation of overall national strength competition in the aftermath of global financial crisis, and the necessary requirement for adapting to the new normal of economic development". Afterwards, "supply-side structural reform" became the major economic policy, and "to cut overcapacity, reduce excess inventory, deleverage, lower costs, and strengthen areas of weakness" was prioritized in recent supply-side structural reform. While making the 13th Five-Year Plan, the

Central Committee proposed to pursue the vision of "innovative, coordinated, green and open development that is for everyone", which has become the program of action guiding China's development during the period of the 13th Five-year Plan or even longer with new values and a new system view.

In this period, the state formulated a series of plans and strategies for development. The most important ones are: "Made in China 2025"[2] aiming to build China into a strong manufacturing power, the program for Beijing-Tianjin-Hebei integration and coordinated development, Yangtze River Economic Belt Development Plan and the "Belt and Road Initiative" (the Silk Road Economic Belt and the 21st Century Maritime Silk Road").

[2]*Made in China2025* (issued on May 8th, 2015) proposed that under the guiding principles of "innovation-driven development, quality first, green development, structural upgrading, and talent-oriented development" and the basic principles of "market-oriented and government-led development, pragmatic planning with long-term perspective, holistic advancement and breakthroughs in key aspects, independent development open to global cooperation", China will work hard to realize strategic manufacturing goals by following the "Three Steps". The first step, by 2025, China will become a major manufacturing power; the second step, by 2035, Chinese manufacturing will reach an intermediate level among world manufacturing powers; the third step, by 2049, the centennial of the founding of PRC, China will become the leader among the world's manufacturing powers. To center around the strategic goal of building China into a great manufacturing power, "Made in China 2025" has highlighted 9 strategic tasks and key aspects and proposed to support and secure them in eight aspects.

Bibliography

A Study on China's Industrial Modernization. (2004). *Research Report by Institute of Industrial Econmics of CASS*. Issue No. 1.

Academic Division of Economics, CASS. (2008). *Ecological environment and economic development.* Beijing: Economy & Management Publishing House.

van Agtm, A. (2007). *The emerging markets century: How a new breed of world-class companies is overtaking the world*. New York: Free Press.

Alfred Thayer Mahan. (1890). *The influence of sea power on history 1660–1783*. Boston: Little, Brown and Company.

Amartya Kumar Sen. (2002). *Rationality and freedom*. Cambridge: Belknap Press of Harvard University Press.

Andrew, A., & Kehoe, P. J. (2007). Modeling the transition to a new economy. Lessons from two technological revolutions. *American Economic Review, 97*, 1.

Arrow, K. J. (2000). *Social choice and individual values* (3rd ed.). New Haven: Yale University Press.

Bao, J. Y. (2007). Targets of China's reform and evolution of economic systems. *Reform of Economic System.* 3.

Baumol, W. J. (2014). *The free-market innovation machine: Analyzing the growth miracle of capitalism*. Princeton: Princeton University Press.

Beck, U. (1986). *Risikogesellschaft: Auf dem Weg in eine andere Moderne*. Berlin: Suhrkamp.

Becker, G. S. (1978). *The economic approach to human behavior*. Chicago: University of Chicago Press.

Bernal, J. D. (1970). *Science and industry in the nineteenth century*. Blooming-ton: Indiana University Press.

Bhagwati, J. (2007). *In defense of globalization: With a new afterward*. Oxford: Oxford University Press.

Broadberry, S., & O'Rourke, K. (2010). *The Cambridge economic history of modern Europe* (Vol. 2).

Brzezinski, Z. (1997). *The grand chessboard: American primacy and its geostrategic imperatives*. New York: Basic Books.

Cai, F. (2013). Studying China's economy from both the short-term and long-term perspectives *Economic Perspectives.* 5.

Chell, E. (2001). Entrepreneurship: Globalization, innovation and development. Cengage Learning EMEA.

Chen, S. C. (2011). US. Forecasts on the next 15 years and its national strategies—A Review on global trends 2025 by US national intelligence council. *Review of Economic Research*. 46.

Chen, Z. Y., & Chen, S. X. (2014). Institutional environment, local government's investment impulse and soft budget constraint. *Economic Research.* 3.

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https://doi.org/10.1007/978-981-15-1506-4

Chenery, H. B., Robinson, S., & Syrquin, M. (1987). *Industrialization and growth : A comparative study*. Oxford: Oxford University Press.
China's Modernization Strategy Research Group, the Center for Modernization Research of CASS. (2005). *Report on China's Modernization (2005)—A Study on Economic Modernization*. Beijing: Peiking University Press.
China's Modernization Strategy Research Group, the Center for Modernization Research of CASS. (2007). *Report on China's Modernization (2007)—A Study on Ecological Modernization.* Beijing: Peiking University Press.
China's Modernization Strategy Research Group, the Center for Modernization Research of CASS. (2004). *Report on China's Modernization (2004)—Path of Regional Modernization.* Beijing: Peiking University Press.
Cody, J., Hughes, H., & Wall, D. (1980). *Policies for industrial progress in developing countries*. New York: Oxford University Press.
Enderle, G. (1999). *International business ethics: Challenges and approaches*. Notre Dame: University of Notre Dame Press.
Fan, K., & Song, Z. X. (Eds.). (1980). *Modern economic history of foreign countries*. Beijing: People's Publishing House.
Fang, F. S. (2007). *China fever: Fascination, fear, and the world's next superpower*. Berkeley: Stone Bridge Press.
Freeman, C., & Louçã, F. (2001). *As time goes by: From the industrial revolutions to the information revolution*. Oxford: Oxford University Press.
Friedman, B. M. (2006). *The moral consequences of economic growth*. Visalia: Vintage.
Gao, S. Q. (2008). Only reform can make China prosperous. *Guangming Daily.* January, 8th, 2008.
Giddens, A. (1990). *The consequences of modernity*. Stanford: Stanford University Press.
Gillis, D., Perkins, M., Roemer, D., & Snodgrass, M. (1987). *Study guide and workbook to accompany: Economics of development.* (2nd ed.). New York: W. W. Nortam and Co.
Gomory, Ralph E., & Baumol, William J. (2001). *Global trade and conflicting national interests: National rivalry in a world of growing productivity and large-scale production*. Cambridge: MIT Press.
Gore, A. (2007). *An inconvenient truth: The crisis of global warming*. London: Bloomsbury Publishing.
Grootaert, C., van Bastelaer, T., & Puttnam, R. (2002). *The role of social capital in development: An empirical assessment*. Cambridge: Cambridge University Press.
Hardin, G. (1995). *Living within limits: Ecology, economics, and population Taboos*. Oxford: Oxford University Press.
Harrison, L. E., & Huntington, S. (2001). *Culture matters: How values shape human progress*. New York: Basic Books.
Heyne, P. L., Boettke, P. J., & Prychitko, D. L. (2013). *The economic way of thinking*. London: Pearson.
Hobsbawm, E. (2014). *Fractured times: Culture and society in the twentieth century*. New York: New Press.
Hobsbawm, E. (1999). *Industry and empire. From 1750 to the present day, (rev. and updated with Chris Wrigley 2nd ed.)* New York: New Press.
Hold High the Great Banner of Socialism with Chinese Characteristics and Strive for New Victories in Building A Moderately Prosperous Society in All Respects. A Speech made by Hu Jintao to the 17th National Congress. October 15, 2007.
Hu, A., Sun, J., & Yao, P. (2014). China's urbanization strategies: From unrealistic goals to rational regional planning. *Economic Management Journal.* 5.
Huang, Z. F. (2000). *Sustainable development and ecological economics*. Beijing: China Environmental Science Press.
Hull, J. O. (1996). From Rostow to Chandler to you: How revolutionary was the second industrial revolution? *Journal of European Economic History* (Spring), *25*(1).

Hume, David. (1985). *The history of England: From the invasion of Julius Ceasar to the revolution in 1688*. Indianapolis: Liberty Fund Inc.
Information Office of the Ministry of Land and Resources. (2006). *Research Report on Sustainable Development of China's Land Resources. 2005.* Beijing: Geology Publishing House.
Inglehart, Ronald. (1997). *Modernization and post-modernization: Cultural, economic, and political change in 43 societies*. Princeton: Princeton University Press.
Inglehart, R. (1990). *Culture shift in advanced industrial society*. Princeton: Princeton University Press (1997).
Institute of Industrial and Technological Economics of NDRS, School of Geography of Beijing Normal University. (2012). A Report on the Development of Top 500 Enterprises in China (2010/2011). *Economic Materials for Reference*, Issue No. 15c-1.
Institute of Industrial Economics of CASS. (2008). *China's industrial development report—30 years of industrial reform and opening-up.* Beijing: Economy & Management Publishing House.
Isard, W. *Location and space-economy: A general theory relating to industrial location, market areas, land use, trade, and urban structure*. London: Forgotten Books.
Jin, B. (2003a). *Economics of competitiveness*. Guangzhou: Guangdong Economy Publishing House.
Jin, B. (2005). *Competition order and competition policies*. Beijing: Social Sciences Academic Press.
Jin, B. (2007). *The international competitiveness of Chinese Industry*. Beijing: Foreign Languages Press.
Jin, B. (2009). *Resources and growth*. Beijing: Economy & Management Publishing House.
Jin, B. (2013d). *China's industrialization: How it changed china significantly*. Beijing: China Social Sciences Press.
Jin, B. (2015a). *Backbone of major country: China's industrialization over the past 65 years and its reflections*. Guangzhou: Guangdong Economy Publishing House.
Jin, B. (2015b). The strategic thinking of regional economy development under the new normal. *Regional Economic Review, 3,* 5–10.
Jin, B., & Li, G. (Ed.) (2011). *China's development pattern—Exploration of Chinese economists*. Beijing: Economic Science Press.
Jin, B. (1993). On private economic behavior in socialist economy. *Jiangsu Social Sciences*. 3.
Jin, B. (2003b). The position and role of high-tech in China's industrial development. *China Industrial Economy*. 12.
Jin, B. (2007). Track and enlightenment from China's development since 1978. *China industrial economy*. 5.
Jin, B. (2008a). 30 Years' reform and opening-up of China in the course of world industrialization. *Finance and Trade Economics*. 11.
Jin, B. (2008b). Chinese industrialization: Resource route and resource supply & demand. *China Industrial Economics*. 2.
Jin, B. (2008c). The awakening of the desire for wealth: A retrospection of the course of reform and opening-up over the past thirty years. *Journal of Nanjing Normal University (Social Science Edition).* 3.
Jin, B. (2011a). China industry's transformation and upgrading. *China's Industrial Economics*. 7.
Jin, B. (2011b). Resource constraint and China's path of industrialization. *Qiushi*. 8; *Hongqi Digest*. 5.
Jin, B. (2011c). The economics nature of livelihood. *China Industrial Economics*. 1.
Jin, B. (2013a). *Global competition trend and China's industries development*. Economy & Management Publishing House.
Jin, B. (2013b). The mechanism of reform decides its outcome. *Economic Research Journal*. 2.
Jin, B. (2013c). The strategic direction of China's industrial restructuring at the current stage. *Qiushi*. 4.
Jin, B., Li, P., Liao, J. (2013e). China's Industrial Global Competitiveness and Its Future Trends China Industrial Economics. Issue No. 5.

Kelly, K. (2010). *What technology wants*. London: Penguin Books.
Kennedy, P. (1993). *Preparing for the twenty-first century*. New York: Random House.
King, C. (2013). *China's success story*. Munich: GRIN Publishing.
Krugman, P. (1986). *Strategic trade policy and the new international economics*. Cambridge: MIT Press.
Krugman, P. (1992). *Geography and trade*. Cambridge: MIT Press.
Krugman, P. (1997). *Development, geography, and economic theory*. Cambridge: MIT Press.
Laboy-Nieves, E. N., Schaffner, F. C., Abdelhadi, A., & Goosen, M. F. A. (2008). Environmental Management. *Sustainable development and human health*. Boca Raton: CRC Press.
Landes, David. (2003). *The unbound prometheus: Technical change and indus-trial development in Western Europe from 1750 to the present* (2nd ed.). New York: Cambridge University Press.
Li, Y. N. (2009). *China's unbalanced economy*. Beijing: Encyclopedia of China Publishing House.
Li, Y. N. (2010). *Industrialization and institutional adjustment: Study of the economic history of western Europe*. Beijing: The Commercial Press.
Li, Z. N., & Wen, F. (2011). *China's megatrends 2: Innovation changes China*. Beijing: All-China Federation of Industry and Commerce Publishing House.
Li, X. X., & Zhang, L. L. (2013). China's energy strategy in response to world new changes. *Review of Economic Research.* 2.
Li, D., & Chen, Z. (2007). Has there been rapid productivity growth in China during its reform period? *China Economic Quarterly*. 1.
Li, G., & Liu, J. C. (2014). Estimation of China's provincial inclusive wealth index: 1990–2010. *China Industrial Economics*. 1.
Liu, S. J. (2011). A decline in growth rate and transformation of development pattern. *Economic Perspectives*. 5.
Lv, B., & Yu, Y. (2009). Increasing returns and China's capital accumulation in its industrial sector. *Economic Theory and Business Management*. 3.
Ma, C. D. (1995). *Economics of resource ecology*. Jinan: Shandong People's Publishing House.
Mackinder, H. J. (2004). The geographical pivot of history (1904). *The Geographical Journal, 170*(4), 298–321.
Mahbubani, K. (2009). *The new Asian hemisphere: The irresistible shift of global power to the east*. New York: Publishing Affairs.
Mantoux, P. (1961). *The industrial revolution in the eighteenth century*. New York: Routledge.
Marsh, P. (2012). *The new industrial revolution*. New Haven and London: Yale University Press.
McKibben, B. (2008). *Deep economy: The wealth of communities and the durable future*. London: St. Martin's Griffin.
McNeill, W. H. (1998). *A world history* (4th ed.). Oxford: Oxford University Press.
Miller, R. L., Benjamin, D. K., & North, D. C. (2001). *The economics of public issues* (12th ed.). New York: Pearson.
Morris, I. (2014). *The measure of civilization: How social development decides the fate of nations*. Princeton: Princeton University Press.
Ohmae, Kenichi. (1991). *The mind of the strategist: The art of Japanese business*. New York: McGraw-Hill Education.
Palmer, R. R., Colton, J., & Kramer, L. (2001). *A history of the modern world* (9th ed.). New York: McGraw-Hill Humanities.
Pei, C. H. (2013). Analysis on the orientation of future economic development and growth. *Economic Perspectives.* 2.
Porter, M. E., Schwab, K., & Lopez-Claros, A. (2005). *The global competitiveness report 2005–2006*. London: Palgrave Macmillan.
Porter, M. E. (1990). The competitive advantage of nations. *Harvard Business Review.* March–April.
Ralph, P. L. (1997). *World civilizations*. New York: W. W. Norton & Company.
Rawls, J. (1999). *A theory of justice* (2nd ed.). Cambridge: The Belknap Press of Harvard University Press.
Rees, J. (2017). *Natural resources: Allocation, economics and policy*. Abingdon: Routledge.

Research Group of Industrial Operation of Institute of Industrial Economics CASS. (2011). *Perspective of industrial economic situation in 2011*. China Industrial Economics. Issue No. 3.

Research Group of Shanghai Academy of Development & Reform. (2013). *Causes, features, impact and policies of new industrial revolution.* Shanghai Economic Forum. Issue No. 2.

Rifkin, Jeremy. (2013). *The third industrial revolution: How lateral power is transforming energy, the economy and the world*. London: St. Martin's Griffin.

Roach, Stephen. (2009). *The next Asia: Opportunities and challenges for a new globalization*. Hoboken: Wiley.

Sachs, J. D. *The price of civilization: Reawakening American virtue and prosperity.* New York: Random House.

Samir, A. (2000). *Les défis de la mondialisation*. Paris: L'Harmattan.

Sen, A. (2000). *Development as freedom*. New York: Anchor Books.

Senor, D., & Singer, S. (2011). *Start-up nation: The story of Israel's economic miracle*. New York: Twelve Hachette Book Group.

Shang, J. (1997). *Resource economics: Reasonable exploitation and use of resources*. Harbin: Harbin Publishing House.

Shen, B. X. (2007). *Formation of socialism with Chinese characteristics during reform and opening-up.* China's Reform. 10.

Sorman, G. (2006). *Made in USA : Regards sur la civilisation américaine*. Paris: Fayard Publishing House.

Spulber, D. F. (1989). *Regulation and markets*. Cambridge, Mass: MIT Press.

Stallings, B. (2000). *Growth, employment, and equity: The impact of the economic reforms in latin America and the Caribbean.* Washington D.C.: Brookings Institution Press.

Stiglitz, J. E. (1996). *Whither socialism?*. Cambridge: MIT Press.

Stiglitz, J. E., & Carl, E. (2009). *Walsh Economics* (4th ed.). New York: W. W. Norton & Company.

Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2010). *Mismeasuring our lives: why GDP doesn't add up: the report*. New York: New Press.

Sustainable Development Strategy Research Group of The Administrative Center for China's Agenda 21. (2011). *Pattern of development: The spatial and temporal evolution of China's resources, environment and socio-economy.* Beijing: Social Sciences Academic Press.

Sustainable Development Strategy Research Group, CASS. (2006). *2006 China sustainable development strategy report: Building a resource-efficient and environment-friendly society*. Beijing: China Science Publishing & Media.

The State Council Information Office of the PRC. *China's Energy Conditions and Policies*. December, 2007.

The State Council Information Office of the PRC. Environmental Protection in China (1996–2005). June 2006.

Toffler, A., & Toffler, H. (2006). *Revolutionary wealth*. New York: Knopf Doubleday Publishing Group.

Turner, C. H., Trompenaars, A. (1993). *The Seven Cultures of Capitalism: Value Systems for Creating Wealth in the United States, Japan, Germany, France, Britain, Sweden, and the Netherlands.* London: Piatkus.

Wang, J. H. (2001). *The guide to government regulation economics: The basics and its applications*. Beijing: The Commercial Press.

Wang, L. L., & Wei, H. K. (2003). *China's western development strategy*. Beijing: Economy & Management Publishing House.

Wang, S. H. (2013). How to understand the unprecedented opportunities and challenges. *Scientific Development.* 2.

Wang, X. (2007). China's reform moving into a new phase: Features of the reform in the new period demonstrated in Hu Jintao's speech to the 17th national congress. *China's Reform.* 12.

Wang, X. J. (Ed.). (2008). *China's opening-up over the past 30 years: Growth, structure and structural changes*. Beijing: People's Publishing House.

Wang, Y. Q. (2007). On China's development model: The costs and benefits of China's decentralization approach to transition. *Economic Research Journal*. 1.

Weber, M. (1992). *The protestant ethic and the spirit of capitalism.* (Translated by T. Parsons). London and New York: Routledge.

Wei, H. (2014). *A New road to urbanization with Chinese Characteristics*. Beijing: China Social Sciences Press.

Williams, M. (1994). *International economic organizations and the third world*. Harvester Wheatsheaf.

Wu, Y. J., & Qi, S. R. (1994). *The world history: Modern history II*. Beijing: Higher Education Press.

Wu, Y. X. (2011). *Historical survey on the US government's experiences of developing new industries*. China Review of Political Economy. 2.

Yan, M. M. (2001). *A new perspective on ecological economics: Theory, methodology and application*. Beijing: China Science Press.

Yang, S. J. (2000). *China: Reform, development and stability*. Beijing: China Development Press.

Yu, R. X. (2006). *Evaluation of western China's natural resources competitiveness*. Beijing: China University of Geosciences Press.

Zhang, W. W. (2012). *China's wave: Rise of a civilizational state. Hackensack*. Hackensack: World Century Publishing Corporation.

Zhang, W. (2015). China's road in the global context. *Guangming Daily*. April 2, 2015.

Zhang, Y. (2007). Intrinsic characteristics and basic experience of China's economic reform. *Theoretical Horizon*. 3.

Zhang, Z. Y. (2007). Six basic experiences of China's reform and opening-up. *China's Reform Newspaper*, January 8th.

Zheng, X. L., & Zhou, X. A. (2003). *China's Industrialization in the 21st Century*. Beijing: Economic Science Press.

Zheng, B. W. (2011). "Middle Income Trap" and China's three big steps forward: A global lesson. *Strategy and Management*. 5/6.

Zhu, M. (2011). Profound world economic structural changes and new challenges to emerging economies. *Studies of International Finance*. 10.

Index

A
Absolute cost advantage theory, 198
Abundance, 3, 27, 33, 45, 117, 164, 178
Added value, 71, 109, 129, 139, 144, 174, 178
Administrative examination and approval, 10, 96, 153
Advanced manufacturing, 122, 123
All-round in-depth reform, 12, 184
A moderately prosperous society, 13, 18, 45, 69, 180, 185, 186, 189, 190, 218
A new type of industrialization, 123, 189, 190
A new type of major-power relationship, 213
Artificial intelligence, 27
Asian Infrastructure Investment Bank (AIIB), 1, 221
A third path, 18
Attract investment, 86, 88, 117, 129, 181
Automation, 26
Average life expectancy, 42, 43

B
Balance of power, 206–211, 213, 221, 223
Belt and Road initiative, The, 175, 218–223, 237
Bohai economic rim, 166
Bourgeois rights, 8, 34
BRICs, 58, 201
Bureaucratic capital, 225, 226
Buyer's market, 233

C
Capital cost, 74, 87, 88
Capital efficiency, 87, 88
Capital-intensive industry, 5, 126, 234
Capital operation, 65, 100
Carbon emission trading system, 152
Central and western China, 122, 160–165, 167, 169, 175, 230, 234
Centralization, 89
Centralized, 90, 154
Chinese dream, The, 13
Clean energy, 148, 149
Cold War, The, 207, 212, 219
Collectively owned enterprise, 228
Community with shared interests, 220, 222
Comparative advantage, 15, 19, 50, 54, 60, 62, 66, 110, 114, 129, 135, 160, 163, 164, 202, 208
Competitive neutrality, 121
Concentrate resources to accomplish large undertakings, 7, 10
Concentration, 126, 139, 140, 145, 147, 150, 169, 172, 177, 203
Connectivity, 219–221
Construction of the third-tier area, 229, 230
Consumption, 15, 18, 19, 22, 24, 37, 42, 44, 45, 50, 55, 57, 74, 116, 124, 132–134, 137, 139, 143, 144, 146, 147, 151–154, 168, 186, 195, 196, 236
Coordinated development of Beijing-Tianjin-Hebei region, The, 150
Core competency, 19
Core technology, 105, 107, 116, 124, 138
Corporate behavior, 87, 88
Corruption, 4, 87–90, 96, 97, 113, 157
Crossing the river by feeling the stones, 88
Cultural characteristics, 174, 178
Currency, 54, 58, 164, 222
Cut-throat competition, 82, 83, 171, 180

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D
Decisive role of market in resource allocation, The, 11, 12, 91
De-industrialization (to de-industrialize), 18, 122
Demographic dividend, 61
Development is of overriding importance, 85, 128, 170, 182
Development path, 69, 111, 112, 128, 129, 199
Development stage, 17
Deviation, 22, 150
Diffusion of technology, 105, 106, 165
Domestic demand, 54, 74, 163, 167, 168

E
Ecological balance, 150
Ecological carrying capacity, 139, 140
Economic base, The, 13
Economic development zone, 233
Economic globalization, 5, 39, 121, 160, 193, 195–223, 234
Economic incentive mechanism, 37
Economic integration, 108, 167–169, 177, 183, 184, 211, 223
Economic law, The, 8, 11
Economic man, 38, 39, 99
Efficiency, 9, 16, 19, 20, 28, 34, 37, 49, 57, 60, 78, 82–85, 89, 91–94, 106, 109, 111–113, 125, 137, 143, 144, 152, 159, 176, 185, 198, 202, 213
Elasticity of supply, 135
Electrification, 26
Emerging economy, 5, 58, 62, 72, 126, 200, 201, 211, 213
Employment, 13, 47, 52, 96, 171, 188
Energy substitution, 136–139
Enterprises owned by the whole people, 228
Entrepreneur, 9, 27, 119, 173, 174
Environmental protection, 12, 13, 17, 44, 64, 65, 82, 110, 131, 139, 143, 145–155, 169, 180, 183
Environmental quality, 65, 83, 85, 143, 145, 147–151, 156
Equilibrium, 152, 204, 207, 209–211, 213
Era of planned economy, The, 18, 32, 50, 55, 65
Era of reform and opening-up, The, 32, 83
Expansion, 15, 24, 40, 49, 51, 57, 58, 65, 66, 74, 78, 87, 101, 109, 111, 116, 129, 134, 162, 163, 165, 167, 168, 173, 176, 177, 198, 199, 201, 202, 214, 216, 219, 221, 234
Externality, 11, 139, 182

F
Finance, 13, 17, 64, 86, 87, 171
Financial service, 13, 215
First thirty years, The, 9, 69, 86, 88
First world war, The, 210
Foreign reserve, 16
Four Asian Tigers, 5, 201
Four modernizations, 185, 229
Fourth industrial revolution, The, 6, 27
Free passage, 208, 219
Free trade, 16, 40, 59, 176, 177, 184, 196, 199, 200, 202, 204, 208–210, 219, 220, 234
Free trade zone, 176

G
G20, 1
GDP per capita, 41–43, 50, 51, 75, 77, 79, 80, 161, 171, 194, 211, 214, 215
General Agreement on Tariffs and Trade (GATT), 39
Geopolitical and geo-economic, 208
Geopolitics, 84, 172, 199, 212
Get rid of poverty, 35, 83, 89, 128
Give priority to efficiency with due consideration to fairness, 83
Global division of labor, 106, 113, 114, 164
Global governance, 203, 208–213, 218, 222
Global/international competitiveness, 15, 62, 63, 66, 67, 111, 115, 116, 125, 169, 179, 189, 200
Gradient development, 80, 159, 162
Great renewal of the Chinese nation, the, 16, 99, 101
Green industrial revolution, 6

H
High added-value, 109
High-tech development zone, 233
High-tech industry, 16, 17, 111, 115, 126, 139
Hinterland, 166–170, 203, 214, 230
"Hollowing-out" of industry, The, 122, 194
Horizontal growth, 129, 176
Household registration management, 142
Human development, 2, 21–24, 26, 28, 44, 75, 78, 84, 186, 188, 189, 197, 222, 235
Humanized environment, 173

Human right, 95, 211

I

Imbalanced, uncoordinated, and unsustainable, 28, 92
Imitation, 16, 78, 116, 118, 163, 165, 174, 234
Impetus for reform, The, 85, 89, 91
"Import substitution", 5, 13, 54, 226
"In-between technology", 146
Incentive and constraint mechanism, 138
Incentive compatibility, 85, 86, 88
Inclusive development, x, xi
Inclusive growth, x
Inclusive/inclusiveness, 1, 82, 84, 187, 193, 200, 211, 213, 216, 218, 221–223
Income distribution, 50, 60, 88
Incremental reform, 128, 130, 167
Individualism, 33, 47
Industrial civilization, 9, 26, 28, 164, 174, 229
Industrial/industrialized country, 3–5, 36, 125, 200, 214
Industrialization, 1–7, 9, 11–14, 16–29, 31, 32, 34, 35, 38–45, 47, 49, 50, 52–55, 57, 58, 60, 63, 65–67, 69, 72, 73, 75, 81–84, 98, 103–110, 113–116, 121–125, 127–129, 131–137, 139, 141–151, 157, 159–175, 178, 180–182, 185–190, 193–195, 197, 198, 201, 202, 214, 215, 225, 226, 228–235
Industrial organization, 126, 190
Industrial policy, 13, 34, 65, 86, 87, 94, 115
Industrial revolution, 1–6, 21–28, 41, 44, 49, 75–77, 84, 104, 109, 122, 123, 146, 181, 189, 197–205, 209, 222
Industrial spirit, 16, 22, 28, 180, 182
Industrial structure, 14, 18, 64, 69, 105, 110, 122, 124, 126–130, 144, 163, 165, 166, 171, 174, 234
Industrial technical route, 123, 132, 136, 143, 144
Industrial upgrading, 26, 109, 114, 125, 129, 178
Information asymmetry, 11, 96
Innovation, 12, 16, 19, 22, 26–29, 65, 69, 78, 81, 86, 87, 91, 93, 100, 101, 103–106, 108, 109, 115–120, 122, 125, 129, 138, 141, 144, 164, 169, 174, 176–178, 181, 182, 217, 236
Innovation-driven, 69, 94, 100, 101, 103, 105, 117, 118, 125, 141, 171, 181, 197, 237
Innovative country, 22, 69, 100, 101, 105, 110, 174, 218
Innovative, coordinated, green and open development that is for everyone, 46, 180, 237
Intellectual property, 105, 107, 108, 115, 116
Intelligence-based, 26
Intelligent industrial revolution, 6
International division of labor, 5, 54, 106, 196, 202, 203, 214, 215
International Monetary Fund (IMF), 78, 210
Internet penetration rate, 63
Investment, 1, 5, 13, 16, 40, 41, 50, 54, 55, 57, 65, 74, 78, 81, 87, 104, 106, 110, 111, 113, 114, 117, 120, 121, 128, 129, 135, 136, 138, 139, 141, 148, 149, 160, 162, 163, 166, 172, 177, 181, 182, 184, 186, 199, 203, 209, 214, 230, 232–236
Investment-driven, 94, 105, 117, 141
IT application, 142, 189, 190

K

Karl Marx, 4, 13, 195, 196, 199

L

Labor-intensive industry, 5, 64, 126, 234
Labor price, 61, 109, 160
Labor quality, 109
Labor remuneration, 34
Land power theory, 205, 206, 219
Learning from Daqing (in industry), 231
Local protectionism, 87, 88, 155, 184
Local state-owned enterprise, 14, 86, 118–120, 228
Low-cost alternative, 50, 60
Lower price, 15, 60

M

Machinery manufacturing, 3
Made in china, 16, 53, 54, 60, 61, 116, 237
"Made in China 2025", 17, 237
Make economic development the central task, 36, 232
Mandatory plan, 7, 228
Manufactured goods, 54–56, 60, 61
Market deficiency, 94
Market economy, 7–11, 14, 19, 32, 35, 38–40, 46, 47, 50, 55, 89, 94, 95, 97,

111, 128, 146, 152, 153, 165, 196–202, 204, 207, 222, 228, 229, 232, 233
Market failure, 152
Market-for-technology, 114
Market order, 94
Market penetration, 202
Market performance, 126
Market power, 203, 204
Material civilization, 27
Material wealth, 2, 3, 20–23, 25, 26, 28, 29, 35, 36, 41, 44, 105, 146, 151, 171, 180, 188, 189, 198, 202
Mathew effect, 93
Mechanization, 24, 26
Middle class, 42
Middle income trap, 69
Moderate materialism, 82, 83, 97, 170–172, 175, 180
Modern enterprise system, 86, 87
Modern industrial system, 122
Modern service industry, 16
Moving forward in a steady pace, 235

N
National security, 14, 17, 28, 104, 113, 139, 189
National treatment, 115
Natural environment, 23, 132, 151, 173
Network, 5, 25, 40, 53, 97, 114, 115, 175, 177, 189, 203, 236
Newly industrialized country, 4, 5, 125, 200, 214
New normal, The, 69, 70, 73, 74, 77, 78, 80, 81, 83–85, 89–92, 94–101, 170, 171, 175, 236
Northeast China, 166, 173, 231

O
Okun's law, The, 94
Opening-up, 12, 16, 18, 19, 28, 29, 38, 46, 47, 55, 69, 81, 85, 86, 113, 116, 169, 175, 177, 183, 200, 201, 214, 217, 220, 227, 232, 233
Outlook on morality and benefit, 33
Overcapacity, 63–65, 87, 111, 129, 138, 163, 166, 173, 176, 184, 236

P
Pareto improvement, 46, 90
Patent, 2, 107, 108, 196
People's livelihood, 16, 17, 23, 28, 44, 82, 139, 169, 171, 179, 189, 216
Period of national economic readjustment, The, 228
Planned economy, 6–10, 14, 18, 19, 32–39, 50, 55, 82, 83, 91, 128, 200, 226–229, 232, 233
Population aging, 62
Population growth, 41, 75, 76
Post-materialism, 82, 83
Post-war order, 210, 218, 219
Poverty giving rise to a desire for change, 31
Preferential policy, 86, 89, 92, 93, 100, 117, 128, 129, 136, 171, 176, 177, 179, 181, 182, 185, 232
Primary goods, 54, 56
Primary-level initiative, 89, 90
Primary stage of socialism, The, 36, 232
Primitive accumulation, 50, 163
Principle of "negative list", The, 11, 12
Principle of positive list, The, 11
Prioritize/give priority to heavy industry, 7, 8, 18, 147
Processing trade, 60, 74
Production, 2, 3, 5, 6, 9, 13, 15, 19–21, 24–26, 34, 36–39, 42, 46, 50, 54, 60–66, 69, 70, 82, 83, 88–90, 92, 93, 103–107, 109, 110, 114–116, 123–126, 129, 132, 134–136, 140, 143–147, 149, 151, 155, 159–163, 165, 166, 168, 172, 180, 186, 187, 189, 190, 194–196, 198, 201, 205, 226–230, 232, 234
Production factors, 60
Production relations, 12, 13
Productive forces, 4, 7, 12, 13, 18, 28, 34, 35, 37, 39, 46, 47, 92, 162, 186, 189, 190, 233
Productivity, 2, 3, 21, 57, 62, 77, 160, 178, 187–189, 205, 209
Promote efficiency through fairness, 82, 93, 94
Property income, 43
Public finance, 86, 87
Public goods, 11, 88, 89, 91, 99, 152, 153
Public ownership of the means of production, 39, 227
Public services, 85, 184, 196
Putting people first, 20, 183, 186, 188, 189, 235

Q
Quality of life, The, 65, 84, 98, 179

R
Real estate, 46, 141, 174
Reform and opening-up, The, 9, 14, 16, 18, 29, 32, 35–39, 41, 43–45, 51, 54, 55, 62, 70, 77, 79, 82, 83, 86, 92, 95, 98, 104, 117, 140, 161, 166, 184, 220, 232–234
Regional economy, 87, 171, 183
Regulation, 10, 11, 38, 64, 129, 146, 151–157, 165, 196, 232
Re-industrialization, The, 122
Relationship between fairness and efficiency, The, 91, 94
Relationship between government and market, The, 11
Rent-seeking, 89, 92, 99, 138, 157
Resource endowment, 114, 133, 135, 136, 139, 142, 164
"Resources" and "wastes", 143
Rise of central china plan, The, 161, 162, 169, 234
Rule of law, The, 82, 83, 89, 90, 95
Rural commune-, brigade-, and team-run industries, 9

S
Savings, 41, 45, 50, 54, 55, 57, 117, 226
Scientific and technological revolution, 22, 204
Scientific outlook on development, The, 20, 46, 235
Sea power theory, 205, 206, 219
Second-best choice, 92
Second industrial revolution, The, 1, 3, 4, 6, 77, 200
Second world war, The, 4, 5, 197, 206, 207, 210
Seller's market, 233
Service-oriented, 28, 182
Shortage economy, 55, 64, 163, 233
Silk road economic belt, The, 1, 175, 177, 237
Silk road fund, The, 1
Socialism with Chinese characteristics, 29
Socialist market economy, 10, 18, 38, 39, 43, 83, 94, 117, 233
Social security, 11, 13, 55, 183
Social security network, 11
Special economic zone, 117, 176, 177, 232, 233
Sphere of influence, 209, 210, 219–222
State-Owned Enterprise (SOE), 14, 118, 119, 232
State-run enterprise, 228
Strategic emerging industry, 125
Structure of imports and exports, 54, 56
Subsidy, 117, 128, 129, 136, 138, 154, 171, 185
Sunset industry, 122, 123
Super-national treatment, 114
Superstructure, 13
Supply-side structural reform, 130, 166, 236
Surplus value, ix
System of social reproduction, The, ix

T
Technical route, 106, 120, 123, 138, 143, 146
Technological innovation, 4, 16, 19, 22–24, 26, 65, 86, 92, 94, 100, 103–107, 114–121, 123, 125, 129, 139, 141, 176, 178, 179, 181, 182, 185
Technological progress/advances, 5, 7, 22, 26, 28, 49, 100, 103–107, 111–117, 121, 136, 139, 173, 189, 202, 231
Technology intensive industry (tech-intensive industry), The, 5
Third industrial revolution, The, 1, 5, 77, 200
"Three transformations" campaign, 227
Top-level design, 89–91, 150
Transaction costs, 96, 97
Transformation and upgrading, 123, 125
21st century Maritime Silk Road, The, 1, 175, 237
2008 global financial crisis, 58, 72, 78, 81, 122

U
Ultra-materialism, 172
Urbanization, 17, 24, 139, 141, 142, 185–190

V
Vanity project, 93
Venture capital, 65
Vested interests, 88, 90, 99
Village and township industry, 9

W
Weak effective demand, 63
Wealth-driven, 141
Welfare, 17, 28, 39, 46, 47, 127, 139, 146, 156, 169, 171, 182, 183, 189, 197, 202, 222
Welfarism, 82, 84

Western development program, 161, 162, 169, 234
Westphalian system, 209–212
Win-win, 1, 46
World Bank, The, 1, 43, 66, 78, 194, 210
World Trade Organization (WTO), 39, 40, 58, 59, 61, 115, 121, 193, 194, 197, 210, 214, 234

Y
Yangtze river delta, 150, 166, 167, 169, 177, 233
Yangtze river economic belt, 150, 151, 177, 237